

# DRAGON



# USER

*The independent Dragon magazine*

November 1987

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### APPEAL + APPEAL + APPEAL + APPEAL

Is the struggle to get SEPTEMBER to its rightful owners, since people were sent duplicate copies. We now have a shortage in the office — so if anyone has a spare SEPTEMBER they can bear to part with, please invest tip and send it back to us at your leisure.

## Editorial

WELL, they didn't lynch me at Rochdale. But if they had I would not have been surprised. To all the readers who phoned or wrote to us, particularly to those who were told first one date and then another, thank you for bearing with us. Considering that she has been answering the phone to Dragon users almost back to back for the last three weeks, and faces another week of it while the issues crawl through the post, Carol is still speaking to me, so you must have been nice to her.

Thanks, it's been a very, very long time since we last missed our print date (if ever, indeed) and I hope it never ever happens again.

A small factor like someone leaving suddenly can end up affecting thousands of individuals who don't know what's happening, and wish it wasn't, not to mention those who think they know what's happening, and wish it wasn't.

At 1.14pm on Thursday 19th September the first reader PHONED US BACK TO SAY THAT HIS COPY HAD ARRIVED! Thank you a thousand times, Mr. Hartley. But I know some of you still hadn't received it by the 23rd. And the 17th was the publication day for the OCTOBER edition. No, I hope this never happens again.

### How to submit articles

The quality of the material we can publish in Dragon then each month will, to a very great extent, depend on the quality of the responses that you can make with your Dragon. The Dragon computer was launched on to the market with a powerful version of Basic, but with very poor documentation.

Articles which are submitted to Dragon (for publication) should not be more than 2000 words long. All submissions should be typed. Please leave wide margins and a double space between each line. Programs should, whenever possible, be computer printed on plain white paper and be accompanied by a tape of the program.

We cannot guarantee to return every submit, not article or program, so please keep a copy. If you send us your program on microfilm, include a stamped addressed envelope.

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# Letters

This is your chance to air your views — send your tips, compliments and complaints to Letters Page, Dragon User, 12-13 Little Newport Street, London WC2E 8PP.

## Hands off our OS-9

I HAVE read Three Little Words in the June 1987 issue of Dragon User, and I feel quite strongly about the negative comments made about Stylagraph. It seems obvious that Mr. Merrick has not been able to master rudimentary OS-9.

I would argue that Stylis can be enhanced by an 80 column screen display, and of course two drives are better than one. But Stylis is the leader of all PC word processors I have seen. For the comment on the double line feed, he should read Rodney's article in the March 1987 issue, and check the OS-9 switches on his printer. One of these will control the line feed/carriage return mode. Reverse the switch and it will work. You will have to reset the switch for listings in Dragon mode, but it is not necessary to ditch your current printer.

The volume of memory is governed by the user. To obtain 512K on a level one system, use a parameter value on the Stylis calling statement, eg Stylis later OS-9, which should give you 5 or 6 pages to work with. If your memory is larger, you can unload what you have written to disc, and carry on writing, and the whole document will remain under the same filename. The limit to the size of your document is effectively the size of your formatted disc.

The Spell and Mail merge programs are most professional. The standard dictionary contains 40000 words, and you can add as many as you like. Mail merge gives the ability to print multiple copies and make text substitutions while printing.

If you run a small business, OS-9 is most certainly suited. A lot of upgrade to your Dragon 64, like a second disc drive, a printer, monitor etc, is worth the investment. There are packages like Cash and Mail and Stock Control.

My wife who is a creative writer and computerist is horrified when I tell her the time had come to change word processors. With utilities provided by the OS-9 User Group (log on to their original works on OS-9 formatted diskettes).

The first week was almost unbearable for us both, with in-

Every month we will be shelling out a game or two, courtesy of Microdeal, to the readers who send the most interesting or entertaining letters. So send us your hints and your opinions, send us your hi-scores and suggestions. Send us your best Dragon stories. What if you think we are, mind readers??



## Words of wisdom for the wise

I greatly enjoy struggling with Gordon Lee's powers. Not only that, I have found them a great help as an aid to programming.

When teaching Dragon I had no knowledge of Basic programming, so I had to start from scratch. I did not find copying out programs from the manual very helpful. I found that the 'back it and see' — sometimes known as the experimental — method helped me most. Things one finds out for oneself tend to stick in the mind.

Many of you Dragon User readers have the advantage over the almost only magazine I read of a connected keyboard, and I can't spell. Because of this I have been officially certified the World's Worst Programmer! In spite of this, I have won the odd prize. So you are and all are in with a chance.

For those who would like to have a go, although it is worth having a good read of the Dragon manual, I recommend the 'try it and get it wrong' method (Dorwin's Answer at the 'back it and find it a Chinese salad primer method — did I in the manual there is a list of all the Dragon commands).

Start with the PRINT command, because it helps if Dragon gives an output, then play with INPUT, and carry on from there. By experimenting one can find out what to do, even things not in the manual.

A final point. With Gordon's powers, I always try to solve them by several quite different means. If they two answers that are the same, then they could be right. But, above all, trying different methods gives considerable insight into programming.

Derek Huntington

Bob Newman  
103 New New Road  
Addlestone  
Surrey  
KT15 2DA

Looks like Ted wins again

quent phone calls from home demanding how, and why and where, and that I return Ted's letter to him. The second week was a dramatic change. My wife was creating networks with vigor, and checking the odds with the Spell program. The moral is 'a little persistence will reap great rewards'.

B.G. Graydon  
50 Hawthorn Crescent  
Cessham  
Poyntonville  
Hants PO21 2TP

## Style style

I HAVE read Three Little Words in the June issue and I think Mr. Merrick has not read the manual carefully. All style programs can be used successfully if understood. They have real differences of operation, and since they have to work with a selection of printers, need time to be used to their best advantage.

Stylagraph will not send codes over GDI as it was designed for a P-bit bus which was the American standard at the time. Merrick is very slow because it is in Basic, but this adaptability to different computers and printers, Stylis is possibly the most powerful compact word processor I have seen, and though it does not have justification or spelling correction as standard, it has features not found in most theme packages.

The embedded format codes allow you to send any character in the range 0-255 directly to the printer, allowing use of any character the printer can produce, or nearly any printer. Format or typeface can be changed during printing, allowing mixed fonts or styles. The embedded codes should sometimes be followed with spaces to make them work properly.

Incidentally, as files generated by Stylis are text files, they should not be named as back up files, but as updated files, ie PREFIXED, PREFIXED/TEXT under Dragon-OS-9. On OS-9 there are no bugs, so no problems arise.

If we can be of help to any readers we will provide they send us SAE.

A.C. Emshier  
(high security systems)  
23 Deified Crescent  
Ladbroke  
Middlesex W8 2ET

PS Can anyone help us? We have a fairly serious, but it has become corrupted and will no longer load.

## Not so Mfree

Roger Merrick's article on word processors made some valid points, but I feel that he was less than fair to OS-9 and Stylagraph.

OS-9 is complex and can be frustrating, but Stylis is automatic in its use of the OS-9 filing system, and you need know only a little to use it. A small business would surely find OS-9 worth the initial cost. Also, the idea of putting OS-9 in ROM would be a revolution.

stilted legacy of OS-8 — the fact that the number of commands available is only limited by the size of your disc, and that extra utilities are readily available from the public domain through user groups.

Impressed by Mr. Menick's use of MIFREE to check the memory available, I fyou call this from Sglo, you are checking what is left to OS-8, not what is available to your text. You can call different amounts of memory for text, using STYLO 8100, for example, and the more you ask for, the less will show on MIFREE. Also, OS-8 version 2.0 has a better screen driver, and a built-in register, which Mr. Menick prefers. However, using the CompuServe DragonPlus board gives a marvelous 80 column display and an almost instantaneous response to which your commands may be put. I could argue that even allowing for the hundred pounds or so for the set-up, you have a system which would compete favourably with much more expensive machines. Sglo can make Silester seem like a toy by comparison, used as it is.

Silester on the other does right justly. Just press J in the format menu, and K to remove it. The problem with Silester is that it is all too easy to lose text — try printing out before saving, and with some printer settings you lose the text. Also, if your disc is full, I fyou are lucky Silester will tell you. On the other hand, a might make all over your existing files, as mine did. (Yes, I did have a backup, Hah!) And I would patiently line up tables of figures and select 80 columns width for the printer, only to find that Silester had rearranged the text beyond recognition. Sglo allows the time length to be set first, another embedded format commands are much more straightforward.

Incidentally if you don't want OS-8's facilities, Flex is somewhat simpler to learn, and Flex's SPEdit is really Sglo under another name.

David Anthony  
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Glossop  
Derbyshire  
SK12 6NP

Once again, the OS-8 Users Group can be contacted through Martin Vermaas, a Roseberry Court, Llanidloes, Gwynedd, LL50 1TF

## Author gets it right

Thank you for publishing *Three Little Words*. A number of points have occurred to me since submitting this to you last year.

4) The problems of Stylograph are overcome by simply entering the patches published in a recent issue of Dragon User.

5) Below a three and a half inch disc uses a different standard and cannot be successfully connected to the Dragon disc cartridge.

6) Andy CoCo OS-8 will not boot the Dragon because the device drivers and the disc format are different.

7) I joined the OS-8 Users Group and have made most progress in OS-8 since then. I am in all the time before.

8) A 20 megabyte hard disc and interface would now cost around £200. When I bought the DragonDOS disc drive from Boots, it cost me ... £250.

Roger Menick  
30 Dean Road  
Stratford  
Birmingham  
B27 6DP

## Atoms are found again

In an old copy of Dragon User (June 1984) I found a program with the name 'In search of Atoms'. At first the description disappointed me, but I decided to try it. I have put it in and tested it most of the time. It is very good with the use of colour, and is easy to play. When playing it you must think quite a bit. If you have June 1984 and want a good game, try it.

This is not necessary, but I recommend you to change the 620 to:

620 IN=INT(SL\*PI\*2)  
(TIMEP)+1  
PI=INT(SL\*PI\*2\*(TIMEP)+1

Otherwise the same configuration carried up with every new start.

Martin Norman  
Chesham Avenue 12  
F4-51 Solihull  
Sweden

# MORE NEW DRAGON GEAR FROM HARRY!

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# News desk

If you have any new products for the Dragon — software or hardware — ring the News Desk on 01-437 4343

## Discs from Preston

R & A J PRESTON are collating some popular older titles (on disc) and tape, to be released shortly.

Rudy Robbs, Pentabus Pilot and Despatch Dan are together on one disc, and Kung Fu, The Master is on another. Space Jack and the game Novell will also be available together.

Cassette versions will cost £2.99 and disc versions £4.99. For more information contact R & A J Preston, Kings Hall Court, St. Bridges Major, Mill, Salford, Greater Manchester M6 6JL, 0662 610065. Even so for the, Preston's are representing Dragon users at the POW Show in London.

## NDUG see double . . .

Here's the August issue of Dragon Update. Paul Grade is beginning to make Editor-on-the-point-of-tracking noises (it's the final, the dust...), I've noticed that professional editors only go right off their trolleys. Another one goes right off their trolley. You can't get away from it, you're, except by leaving the country. Which you can't do, because there's too much rain.

The August Update has articles on Pascal for beginners, easy machine code, running C under DragonDOS, a review of Music Maker, some DeltaDOS news (with Dave Martin waving words because more Delta users aren't registering. What, not speaking to each other? United we stand, remember), a couple of small handy hardware reviews, some good advice for people thinking of starting their own magazines (after the demise of Dragon's Italy, and a review of Commodore's Galactic Star... which brings me to

The Larsons (the editor) scuffling off about people sending the same article to Update and to other publications. Which usually means Dragon User. I only found out about Galactic Star when it was too late to paste something out of it. Now, obviously I entirely believe in the author's innocence — it is so difficult to get things printed that it always seems like good sense to run off four copies and send them to different publications — I have to request that anyone else who feels innocent, gets wise. Broad-mindedness is all very well, but actually people don't like buying two different mags and reading the same things in both of them (the occasional reprint is acceptable, but that's all), and if you think about it, writers are pretty lazy, and if we all did that you'd have a double

of eight identical newspapers every morning. So please don't do it. At best you won't get paid, and at worst you'll be very unpopular, and have even more difficulty getting things printed.

Mike tells me that he does not mind Paul the minded it being printed elsewhere. That's what I mean by innocence, and is taken of that I shall only be doubling half his fee to Dragon Update.

So now that Tim and I have both said it, no-one can say they weren't warned. National Dragon User Group, c/o Paul Grade, 8, Navarre Road, Welling, Sussex.

## OS-9 offer from Denmark

HANS Christian Andersen Computer Inc. have been in touch with us with a special offer for the months of November and December.

As regular readers will be aware, HCA are the official licensees for OS-9 for the Dragon, which enjoys a high reputation, but a correspondingly high price.

For November and December HCA will be offering OS-9 at the considerably reduced price of £37.50 (as advertised, as well as 25% off the price of other software in their regular advertisements).

You should find further details somewhere in this issue of Dragon User, but if you want to contact HCA for details, either without further ado, their address is H.C. Andersen Computer Inc., (England) 380, DK-2799 Rastrop, Denmark. Phone 01 52 44 04. Postage for software is 5% of the order price, up to £5.

## London Show

John and Helen Penn of John Penn Discount Software are organising the 5th 8009 Dragon Show in London on Saturday 16th December.

The show is to be held in the Great Hall of the Connaught Rooms from 10am to 4pm, according to our present information, and we'll be bringing you more information when we receive it. The Connaught Rooms are altogether warmer and more hospitable venue than the Hermitage, and the Penns are organising guest demonstrators as well as trade stands.

This is a good opportunity for everyone who lives within

striking distance of The Smoke to come and support one of the Dragon's most loyal suppliers over the years, as well as many other Dragon names, and do a bit of shopping in time for Christmas. The future of the 8009 Show, and indeed all Dragon shows, depends on users turning up to see what's doing, even if they don't plan to spend a fortune or buy every new product on the market. And it's a great way to meet other Dragoners as well.

You might even get a laugh watching the staff of Dragon User scold the bellied of the September issue another few hundred times, with themes and variations.

## New Starship games

STARSHIP Software were at Rochdale, demonstrating at their new software and the old stuff as well. We have StarShip in the review pipeline. StarShip is described as 49 systems of 2D magic Guide the ball over a hazardous 3D landscape, collecting jagged pieces on route. Beware the cube and the other dragons!

Also on the horizon are CAD-KIDS, with 'lines, boxes, circles, discs...'. JDOAM command for pixel perfect pictures, many types of brushes, for freeware mode. As used to create all StarShip title pages.

and Windex, with 10 user definable windows, icons, pull-down menus, and a pointer, a 32 x 24 display, a real time clock, plus much more! Complete with a suite of dedicated utilities. Easily incorporated into your basic programs. Does NOT require 48K! No price has been announced for the new programs as yet, but StarShip programs typically retail at around £3 to £5.

StarShip's other titles are the Swamy series and Composer Companion and 6th Ave., a collection of routines and 3000 lines of code written on Computer Companion, all published by Microvision, and Hi-Res Test, available from John Penn.

## More room in the Arc

ARC Software are reducing the price of their adventure game The Thirteenth hour from £3.80 to £1.99 (including p&p) as a special Christmas discount from 1 December 1987 to 31 January 1988.

The Thirteenth hour would be better known if it were in a position to advertise more freely, and is well spoken of by those who have played it. An adventure for the price of a discount game is definitely a bargain.

Contact Arc Software at 272 Meana Road, Newton Meana, Glasgow G77 5LX.

## Show in Cardiff

SPONSORED by Dragon dealers and general wholesalers R & A J Preston, the Wales and West Computer Show in November will feature the Dragon as well as other computers. The show is to be held on 21 November at the Central Hotel in Cardiff from 10am to 4pm, and the entrance fee is only £3.

For further information contact R & A J Preston on Southdown 0856 800965.



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## HARDWARE

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# Dragonsoft

## Save and lose

**Program:** *Stone Raider II*  
**Supplier:** Microdeal

**Price:** £10.95

THE instruction manual which comes with Microdeal's *Stone Raider II* is quite simply the best I have ever seen. So far so good, but it's time for another guess, because I'm about to start to talk about the Delta disc upgrade of *Stone Raider II*. My copy had the most incredible bug in it. I thought it was just me, until I checked around, and lo and behold, someone else had the same problem, which is simply this: if you've used the printer, it is 100% certain that when you next access the disc IO the program is going to go into an irretrievable crash. If you don't print your notes before saving it,

then there's no certainty of a crash, just a very big chance. So far, since buying this upgrade, I have lost two acts of a play, certainly not for this magazine, a short story, the first eight chapters of a book, and about fifty seconds songs and poems. At this rate I'm going to follow *Stone Raider II*'s example and switch to an Amstrad Microdeal should stop selling this package until the bug has been sorted out.

Jason Dobson

(See also this month's Letters page. Editors usually give me about three days' grace to get over a system crash, so if your WP starts even once what Jason's WP seems to have done several times, do the sensible thing — start trust it with anything longer than half a page at a time. — Ed.)

## Four in one

**Name:** *Artball*  
**Supplier:** Microdeal  
**Price:** £5.95

**Name:** *Stone Raider II*  
**Supplier:** Microdeal  
**Price:** £5.95

**Name:** *Run*  
**Supplier:** R & A.J. Preston  
**Price:** £3.95

**Name:** *Adventure Writer*  
**Supplier:** Cowan Software  
**Price:** £14.95

MICRODEAL have recently come out with *Stone Raider II* and *Artball*. Of the two, *Artball* is definitely the better designed although it is very, very laggy. The game puts you in a castle dungeon beautifully drawn in black and white 3-D. The object is to find and return a book of spells that the wizard has lost. It's basically a mapping game (as mapped by the keyboard) game; the key to success lies in negotiating your way around the corridors without hitting the spikes, and getting to the pump before you run out of air. The game is really beautiful to play and involves a lot of skill and fast perception. It is a great game on joystick or keyboard, unlike *Stone Raider II* which is a waste for one simple reason — there's no keyboard option and

the game is too fast for joystick work.

In a game like *Stone Raider II* (which is what this is), where positioning and timing are far more important than speed, slow play control like this is fatal. The game contains a cheat for those who can't find it which is becoming a general trend: lags, machine crashes. I have to be able to buy a game that I don't have to work out how to hack to get the full enjoyment from it. If a program has a sixteen designer in it I would like to use it without having to solve several convoluted problems — if I want to do this I'll buy an adventure game.

However, that mistake aside, in accord there are some very interesting layouts in *Stone Raider II* and it seems to have been well thought out. The sound isn't anywhere near Chris Jolly standard but it gets by and the graphics are quite attractive. If you've got *Stone Raider II*, and have finished it with ease, then this one is for you as it really starts where the other finished, surely on why this late into the Dragon's life, are we getting games without keyboard control?

Moving on we come to *Run*, one of Blazy's last releases, which has all the elements of the arcade game in it, but all of them

really ripped off. In the arcade this was one of my favourite games (and, due to the excellent layout in check some of the music, one of my favourite films) but this game just doesn't do it justice. The cycles are as entertainingly idiotic, the thanks are impressively hard, the spiders are messy and the score is the sort of pathetic my two year old cousin would design! Basically this version of *Run* is no better than the other really useless one that's been on the market for quite some time now.

*Adventure Writer* from Cowan Software is, I'm sure a superb piece of programming and I'm equally sure that its creator has written many very good adventures on it. My copy, however, has photocopied A4 sheet after photocopied A4 sheet of comprehensive instructions some of which have helped me start to use the program (it's supposed to be an adventure writing language, well if that's true then it's the most user unfriendly language I've ever used) it makes FORTH seem like baby talk and assembler seem like BASIC. I would really like to be able to give this program a good review because I think a utility of this nature is quite exceptionally useful. However, if it can't be used because someone didn't take time to test out the instructions then what's the point?

Before I sign off and give my ratings on these programs, please do not think I am being pessimistic. I love the Dragon, it is the only computer I own, and it is still the best programmers' machine on the market. This is an appeal to the software companies. If you can get games like *Artball* and *Superkid* then give them to us. We're not apathetic to sort through the stuff to find the most interesting. One other thing, whoever is selling Microdeal's Mega-Jackpot, please stop it... you're embarrassing me!

Jason Dobson

|                  |   |
|------------------|---|
| Artball          |  |
| Stone Raider     |  |
| Adventure Writer |  |
| Run              |  |

## High life

**Program:** *The Immortal Green*  
**Supplier:** (Microsoft)  
20 Microsoft, Watney Garden  
City, Herts HLT 1 7P  
**Price:** £4.00

IT'S time to bring out those old adventure favourites of assorted metal rings, resin in coffee and devil statues in Michael Edwards' latest Microsoft adventure.

As for your purpose in collecting such objects, well accordingly Dragon User news desk a few months back if it was an attempt to become immortal (that explains the title). I suspect it is the obvious item to be a mortal instruction somewhere. This may well be a secret mission, but they could at least enter the poor person who has to do it.

Actually lack of instructions doesn't prove a problem because with any adventure you set off to wander around and pick up any useful looking objects. Also there is a very heavily decorated table in a church telling you what various items to help you succeed in your quest.

Your task begins in a prelude where there's a 'healing of magic' according to the re-designed white text on black background. I would not disagree with this description as when you drop specific objects within its boundary you score mysteriously high. There is a score feature by the way score can check on your progress throughout the game.

Check out your initial problems a real very nice fellow called Zarghen, whose mysterious name fully matches atmosphere generated in the program. This nasty chap goes following you about, and then for no other reason than he's a bit of a madman for nothing, what a waste is applicable gives you immortality rather earlier than you would expect. Except that acting on a fully white cloud playing a harp is obviously what you were after.

A location called 'The old green' soon provides a method of dispatching Zarghen. Having done to him as he would undoubtedly have done to you, the old dad then resurrects himself for a few seconds to try and get his hands on a nearby animal. Not exactly cricket — but then again you're not quite

at the ACE, as shown by the fact that he leaves a map written in Swedish.

Wandering in peace around beaches, cliffs, forests and a church for good measure should reward you instead of different treasures, one found by the old graveyard and coffin scenario, when the text actually tells you this.

The chance to go up and down as well as traditional compass-directions is also used. By exploring downwards you could find yourself amid a sea of fire with a hand stretching out of the inferno.

Also by diverting down you can get on a beach where further along the shore is a motorboat willing to transport you to three other areas (and to the main shore, although as you're initially there it seems a bit of a waste of petrol). In theory the boat should take you to these locations, but it only seems to want to go to the small island and back to the main shore. Southern and northern waters you are told have nothing of interest. If there's nothing worth acquiring there why have a motor boat going to them? Sounds about as truthful as a sentence from a second hand car salesman next door.

Conclusion time is approaching and therefore I'll have to say a few words about the game. It doesn't seem over difficult as the problems are logically solved, but when do you know the game and why does the computer reply 'sorry' when I try to go in to the tent? (No doubt I shall solve these problems about two minutes after I've posted this review.) The game through the church and graveyard has an ominously eerie atmosphere about it and is as well written as any text adventure by a big software house for the Dragon.

Big software houses bring new reality into my gaming slot. Just because this game wasn't advertised in pages of glossy blurb it doesn't mean it's not worth buying. Small firms like Bloomcast deserve all the support they can get — they're not after vast profits but just providing the public with adventures, and good ones at that.

Philip Goss



## Cream cake quaffer

Program: Galacomb Goids  
Supplier: Microvision  
Software  
Price: £795

MICROVISION'S adverts for this title have been describing it as a 'graphic adventure'. On playing through it becomes apparent that it is only just bordering on being an 'arcade adventure'.

This slight misrepresentation doesn't of course alter its quality, but traditional adventure breaks might like to know that the only full word you type in is your name and that movement is totally by joystick.

Setting off with a guarantee may appear as if I don't like the game, but the opposite is true. You do indeed as with all games in this category need, in this case by exploring the numerous vast labyrinthine of Tyres mountain, how and why you're there in the first place is irrelevant; you just have the problem of getting out intact.

In the caverns you are shown an overhead 2D view, and as its pretty (and for its time) it is a round ground case you have a lamp which lights up the walls with a green glow. The catacomb itself is made up of a series of simply drawn passages interspersed with larger caverns where various nasty creatures and also some useful objects are found.

Only a small section of the whole network is shown on the screen and therefore you are able to call up a map which shows all that has so far been discovered. By using this map it becomes apparent that it's not merely a question of learning where everything is on a level and then completing it almost without thinking the next time as a new network is created for every game, adding much necessary variety.

As well as showing where you are the main screen has a box for displaying messages and commands, and a score panel revealing your status and standing.

To pick something up you just move over the object and can then use either the two single-letter commands. For instance, if you find a dagger to hold the weapon you type 'H' and then its corresponding letter on the

inventory, is the third object on the list is letter 'C' and you therefore enter that.

As well as holding weapons threateningly you can perform or take off clothes or armour; quaff potions, read scrolls, throw objects around and eat. Eatable objects are normally apples, cherries or even power pills, though here they're cream cakes — whether you've lapped in a cavern or not you're obviously not on a diet!

You don't only have to eat to survive but to keep your hit points up. How many hit points you have determines how long you can stand the attacks of 'global' 'sparks' and other monsters.

The more monsters that are killed the higher the experience level and the greater the limit on the number of hit points. The hit point level can be replenished by staying out of attack mode. But this mode obviously allows you to attack your foe instead also stops them giving you a fair old thrashing.

There are also bags of gold scattered about for good measure, although they don't look much like money filled sacks just like the cakes don't look like cakes. None of the graphics are razor sharp like, say, *Arbit*, although this is partly down to the fact that the author hasn't sacrificed his four colours just for the sake of electricity.

There is of course the traditional high score table, determined by gold not experience or cavern level as at present would be expected. As for music, well there isn't any. The author obviously isn't a composer as the only sound you Dragon users is the thud of his teletype bell adding up and down the passages anyway.

As with all good games you want to get that bit further and eventually hopefully manage to complete it. With progression you gradually find more potions to use, tougher armour and weapons with greater power, and as always more monsters — how easy life would be without them!

I must be starting to get reasonable at this game as I'm now playing games which are beginning to take over the hour rather than over the minute. If you haven't got a couple of hours for one game then there's the old adventuring option of saving onto a handy blank tape

and resuming later on — well perhaps its not as unlike an adventure after all.

Philip Smart



## Bargain screens

Program: Frankie  
Supplier: Quickbook  
Price: £395

WHEN Wayne Smithson started writing this it was as an alternative to Roy Coates's 100 screen game *Slalom* which never made it to the market and is the ONLY 100 screen game around. As well as being a one-of-a-kind game it has the only loading systems of its type which scrolls the instructions across the middle of the screen while it loads, and the game takes about the same length of time to load as the average Dragon game.

The game can be in one of two colour sets: loaded, screen 0, for protoset, screen 1. You can use joystick or keyboard and there is of course a 'reserved' section which is called Hacker's Delight, which has been mentioned in The Expert's column.

There is an option to re-design the screens in which you can save and load the screens.

On to the game. You are Frankie (Frankie Pick, I know) who has to collect all the keys on the screen in order to go on to the next screen. Trying hard to stop you are eyes, feet, noses, mouths, hands, vampire bats and even Eggs, and to be lightning bolts at you. Thankfully you have a defence against this lot, a laser, but when you use it your energy goes down and when your energy gets to 0 you lose a life. To top it all you have collapsing platforms, killer packs and conveyor belts. Thank heavens for Hacker's Delight!

I can't give Frankie five out of five, as it's quite addictive enough, but it's definitely worth four at the price.

Stephen Dagon



# Down in the dumps

*Dragon User frequently gets requests for screen dumps. Here we present some specimens from our collection*

## Tandy 66P-115

This program is a four-colour screen dump for the 66P-115. After numerous attempts I have finally managed to get a screen dump of reasonable size in two hours instead of 85 hours.

The speed of this program is mainly due to the STDP2 in line 60. The reason for this is that each point on the PMODE 3 graphics screen is made up of three pixels so only half the number of pixels have to be sampled, which cuts down dumping time. As the paper in the 66P-115 is only 4½ inches wide, the screen will be dumped on its side.

If there are any problems I will start them off if you send your question with a stamped self-addressed envelope to Dragon User for forwarding. If starter

## Brother M1000

This following machine code listing is a program which contains two different sized screen dumps. The first one dumps the screen to the printer four times bigger than it does one dot for one pixel. The second is nearly the same as the first, except the screen is printed sideways; the final dump is the same width but is taller.

The program was originally written for dumping in a Brother M1000 printer but should be able to dump to Epson and printers which use a similar code.

To load, type in listing 1, the hex loader, and run it. Enter the data from listing 2, entering ten bytes of data (1 line) at a time. After entering the single string, enter the checksum. If there are any errors you will be asked to enter the line again. Once all

the data has been entered, save it to typing.

```
CGAVER "DUMPS",  
        404020,96H4PED,8H4821
```

To run the first screen dump, type

```
EXEC 404020
```

and to run the second, type

```
EXEC 5H4821
```

D. Ogden

## Tandy 66P-115



```
10 FOR SCREEN# = 1 TO 2  
20 FOR 4-COLOUR SCREEN DUMP FOR THE 66P-  
115 PRINTER  
30 FOR 100 P. PER LINE 50-50-50  
40 FOR 200 P. PER LINE 50-50-50  
50 FOR 300 P. PER LINE 50-50-50  
60 FOR 400 P. PER LINE 50-50-50  
70 FOR 500 P. PER LINE 50-50-50  
80 FOR 600 P. PER LINE 50-50-50  
90 FOR 700 P. PER LINE 50-50-50  
100 FOR 800 P. PER LINE 50-50-50  
110 FOR 900 P. PER LINE 50-50-50  
120 FOR 1000 P. PER LINE 50-50-50  
130 FOR 1100 P. PER LINE 50-50-50  
140 FOR 1200 P. PER LINE 50-50-50  
150 FOR 1300 P. PER LINE 50-50-50  
160 FOR 1400 P. PER LINE 50-50-50  
170 FOR 1500 P. PER LINE 50-50-50  
180 FOR 1600 P. PER LINE 50-50-50  
190 FOR 1700 P. PER LINE 50-50-50  
200 FOR 1800 P. PER LINE 50-50-50  
210 FOR 1900 P. PER LINE 50-50-50  
220 FOR 2000 P. PER LINE 50-50-50  
230 FOR 2100 P. PER LINE 50-50-50  
240 FOR 2200 P. PER LINE 50-50-50  
250 FOR 2300 P. PER LINE 50-50-50  
260 FOR 2400 P. PER LINE 50-50-50  
270 FOR 2500 P. PER LINE 50-50-50  
280 FOR 2600 P. PER LINE 50-50-50  
290 FOR 2700 P. PER LINE 50-50-50  
300 FOR 2800 P. PER LINE 50-50-50  
310 FOR 2900 P. PER LINE 50-50-50  
320 FOR 3000 P. PER LINE 50-50-50  
330 FOR 3100 P. PER LINE 50-50-50  
340 FOR 3200 P. PER LINE 50-50-50  
350 FOR 3300 P. PER LINE 50-50-50  
360 FOR 3400 P. PER LINE 50-50-50  
370 FOR 3500 P. PER LINE 50-50-50  
380 FOR 3600 P. PER LINE 50-50-50  
390 FOR 3700 P. PER LINE 50-50-50  
400 FOR 3800 P. PER LINE 50-50-50  
410 FOR 3900 P. PER LINE 50-50-50  
420 FOR 4000 P. PER LINE 50-50-50  
430 FOR 4100 P. PER LINE 50-50-50  
440 FOR 4200 P. PER LINE 50-50-50  
450 FOR 4300 P. PER LINE 50-50-50  
460 FOR 4400 P. PER LINE 50-50-50  
470 FOR 4500 P. PER LINE 50-50-50  
480 FOR 4600 P. PER LINE 50-50-50  
490 FOR 4700 P. PER LINE 50-50-50  
500 FOR 4800 P. PER LINE 50-50-50  
510 FOR 4900 P. PER LINE 50-50-50  
520 FOR 5000 P. PER LINE 50-50-50  
530 FOR 5100 P. PER LINE 50-50-50  
540 FOR 5200 P. PER LINE 50-50-50  
550 FOR 5300 P. PER LINE 50-50-50  
560 FOR 5400 P. PER LINE 50-50-50  
570 FOR 5500 P. PER LINE 50-50-50  
580 FOR 5600 P. PER LINE 50-50-50  
590 FOR 5700 P. PER LINE 50-50-50  
600 FOR 5800 P. PER LINE 50-50-50  
610 FOR 5900 P. PER LINE 50-50-50  
620 FOR 6000 P. PER LINE 50-50-50  
630 FOR 6100 P. PER LINE 50-50-50  
640 FOR 6200 P. PER LINE 50-50-50  
650 FOR 6300 P. PER LINE 50-50-50  
660 FOR 6400 P. PER LINE 50-50-50  
670 FOR 6500 P. PER LINE 50-50-50  
680 FOR 6600 P. PER LINE 50-50-50  
690 FOR 6700 P. PER LINE 50-50-50  
700 FOR 6800 P. PER LINE 50-50-50  
710 FOR 6900 P. PER LINE 50-50-50  
720 FOR 7000 P. PER LINE 50-50-50  
730 FOR 7100 P. PER LINE 50-50-50  
740 FOR 7200 P. PER LINE 50-50-50  
750 FOR 7300 P. PER LINE 50-50-50  
760 FOR 7400 P. PER LINE 50-50-50  
770 FOR 7500 P. PER LINE 50-50-50  
780 FOR 7600 P. PER LINE 50-50-50  
790 FOR 7700 P. PER LINE 50-50-50  
800 FOR 7800 P. PER LINE 50-50-50  
810 FOR 7900 P. PER LINE 50-50-50  
820 FOR 8000 P. PER LINE 50-50-50  
830 FOR 8100 P. PER LINE 50-50-50  
840 FOR 8200 P. PER LINE 50-50-50  
850 FOR 8300 P. PER LINE 50-50-50  
860 FOR 8400 P. PER LINE 50-50-50  
870 FOR 8500 P. PER LINE 50-50-50  
880 FOR 8600 P. PER LINE 50-50-50  
890 FOR 8700 P. PER LINE 50-50-50  
900 FOR 8800 P. PER LINE 50-50-50  
910 FOR 8900 P. PER LINE 50-50-50  
920 FOR 9000 P. PER LINE 50-50-50  
930 FOR 9100 P. PER LINE 50-50-50  
940 FOR 9200 P. PER LINE 50-50-50  
950 FOR 9300 P. PER LINE 50-50-50  
960 FOR 9400 P. PER LINE 50-50-50  
970 FOR 9500 P. PER LINE 50-50-50  
980 FOR 9600 P. PER LINE 50-50-50  
990 FOR 9700 P. PER LINE 50-50-50  
1000 FOR 9800 P. PER LINE 50-50-50  
1010 FOR 9900 P. PER LINE 50-50-50  
1020 FOR 10000 P. PER LINE 50-50-50  
1030 FOR 10100 P. PER LINE 50-50-50  
1040 FOR 10200 P. PER LINE 50-50-50  
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1080 FOR 10600 P. PER LINE 50-50-50  
1090 FOR 10700 P. PER LINE 50-50-50  
1100 FOR 10800 P. PER LINE 50-50-50  
1110 FOR 10900 P. PER LINE 50-50-50  
1120 FOR 11000 P. PER LINE 50-50-50  
1130 FOR 11100 P. PER LINE 50-50-50  
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1290 FOR 12700 P. PER LINE 50-50-50  
1300 FOR 12800 P. PER LINE 50-50-50  
1310 FOR 12900 P. PER LINE 50-50-50  
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1400 FOR 13800 P. PER LINE 50-50-50  
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1600 FOR 15800 P. PER LINE 50-50-50  
1610 FOR 15900 P. PER LINE 50-50-50  
1620 FOR 16000 P. PER LINE 50-50-50  
1630 FOR 16100 P. PER LINE 50-50-50  
1640 FOR 16200 P. PER LINE 50-50-50  
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1920 FOR 19000 P. PER LINE 50-50-50  
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1950 FOR 19300 P. PER LINE 50-50-50  
1960 FOR 19400 P. PER LINE 50-50-50  
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1980 FOR 19600 P. PER LINE 50-50-50  
1990 FOR 19700 P. PER LINE 50-50-50  
2000 FOR 19800 P. PER LINE 50-50-50  
2010 FOR 19900 P. PER LINE 50-50-50  
2020 FOR 20000 P. PER LINE 50-50-50  
2030 FOR 20100 P. PER LINE 50-50-50  
2040 FOR 20200 P. PER LINE 50-50-50  
2050 FOR 20300 P. PER LINE 50-50-50  
2060 FOR 20400 P. PER LINE 50-50-50  
2070 FOR 20500 P. PER LINE 50-50-50  
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2090 FOR 20700 P. PER LINE 50-50-50  
2100 FOR 20800 P. PER LINE 50-50-50  
2110 FOR 20900 P. PER LINE 50-50-50  
2120 FOR 21000 P. PER LINE 50-50-50  
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2190 FOR 21700 P. PER LINE 50-50-50  
2200 FOR 21800 P. PER LINE 50-50-50  
2210 FOR 21900 P. PER LINE 50-50-50  
2220 FOR 22000 P. PER LINE 50-50-50  
2230 FOR 22100 P. PER LINE 50-50-50  
2240 FOR 22200 P. PER LINE 50-50-50  
2250 FOR 22300 P. PER LINE 50-50-50  
2260 FOR 22400 P. PER LINE 50-50-50  
2270 FOR 22500 P. PER LINE 50-50-50  
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2920 FOR 29000 P. PER LINE 50-50-50  
2930 FOR 29100 P. PER LINE 50-50-50  
2940 FOR 29200 P. PER LINE 50-50-50  
2950 FOR 29300 P. PER LINE 50-50-50  
2960 FOR 29400 P. PER LINE 50-50-50  
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2980 FOR 29600 P. PER LINE 50-50-50  
2990 FOR 29700 P. PER LINE 50-50-50  
3000 FOR 29800 P. PER LINE 50-50-50  
3010 FOR 29900 P. PER LINE 50-50-50  
3020 FOR 30000 P. PER LINE 50-50-50  
3030 FOR 30100 P. PER LINE 50-50-50  
3040 FOR 30200 P. PER LINE 50-50-50  
3050 FOR 30300 P. PER LINE 50-50-50  
3060 FOR 30400 P. PER LINE 50-50-50  
3070 FOR 30500 P. PER LINE 50-50-50  
3080 FOR 30600 P. PER LINE 50-50-50  
3090 FOR 30700 P. PER LINE 50-50-50  
3100 FOR 30800 P. PER LINE 50-50-50  
3110 FOR 30900 P. PER LINE 50-50-50  
3120 FOR 31000 P. PER LINE 50-50-50  
3130 FOR 31100 P. PER LINE 50-50-50  
3140 FOR 31200 P. PER LINE 50-50-50  
3150 FOR 31300 P. PER LINE 50-50-50  
3160 FOR 31400 P. PER LINE 50-50-50  
3170 FOR 31500 P. PER LINE 50-50-50  
3180 FOR 31600 P. PER LINE 50-50-50  
3190 FOR 31700 P. PER LINE 50-50-50  
3200 FOR 31800 P. PER LINE 50-50-50  
3210 FOR 31900 P. PER LINE 50-50-50  
3220 FOR 32000 P. PER LINE 50-50-50  
3230 FOR 32100 P. PER LINE 50-50-50  
3240 FOR 32200 P. PER LINE 50-50-50  
3250 FOR 32300 P. PER LINE 50-50-50  
3260 FOR 32400 P. PER LINE 50-50-50  
3270 FOR 32500 P. PER LINE 50-50-50  
3280 FOR 32600 P. PER LINE 50-50-50  
3290 FOR 32700 P. PER LINE 50-50-50  
3300 FOR 32800 P. PER LINE 50-50-50  
3310 FOR 32900 P. PER LINE 50-50-50  
3320 FOR 33000 P. PER LINE 50-50-50  
3330 FOR 33100 P. PER LINE 50-50-50  
3340 FOR 33200 P. PER LINE 50-50-50  
3350 FOR 33300 P. PER LINE 50-50-50  
3360 FOR 33400 P. PER LINE 50-50-50  
3370 FOR 33500 P. PER LINE 50-50-50  
3380 FOR 33600 P. PER LINE 50-50-50  
3390 FOR 33700 P. PER LINE 50-50-50  
3400 FOR 33800 P. PER LINE 50-50-50  
3410 FOR 33900 P. PER LINE 50-50-50  
3420 FOR 34000 P. PER LINE 50-50-50  
3430 FOR 34100 P. PER LINE 50-50-50  
3440 FOR 34200 P. PER LINE 50-50-50  
3450 FOR 34300 P. PER LINE 50-50-50  
3460 FOR 34400 P. PER LINE 50-50-50  
3470 FOR 34500 P. PER LINE 50-50-50  
3480 FOR 34600 P. PER LINE 50-50-50  
3490 FOR 34700 P. PER LINE 50-50-50  
3500 FOR 34800 P. PER LINE 50-50-50  
3510 FOR 34900 P. PER LINE 50-50-50  
3520 FOR 35000 P. PER LINE 50-50-50  
3530 FOR 35100 P. PER LINE 50-50-50  
3540 FOR 35200 P. PER LINE 50-50-50  
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3560 FOR 35400 P. PER LINE 50-50-50  
3570 FOR 35500 P. PER LINE 50-50-50  
3580 FOR 35600 P. PER LINE 50-50-50  
3590 FOR 35700 P. PER LINE 50-50-50  
3600 FOR 35800 P. PER LINE 50-50-50  
3610 FOR 35900 P. PER LINE 50-50-50  
3620 FOR 36000 P. PER LINE 50-50-50  
3630 FOR 36100 P. PER LINE 50-50-50  
3640 FOR 36200 P. PER LINE 50-50-50  
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3670 FOR 36500 P. PER LINE 50-50-50  
3680 FOR 36600 P. PER LINE 50-50-50  
3690 FOR 36700 P. PER LINE 50-50-50  
3700 FOR 36800 P. PER LINE 50-50-50  
3710 FOR 36900 P. PER LINE 50-50-50  
3720 FOR 37000 P. PER LINE 50-50-50  
3730 FOR 37100 P. PER LINE 50-50-50  
3740 FOR 37200 P. PER LINE 50-50-50  
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3810 FOR 37900 P. PER LINE 50-50-50  
3820 FOR 38000 P. PER LINE 50-50-50  
3830 FOR 38100 P. PER LINE 50-50-50  
3840 FOR 38200 P. PER LINE 50-50-50  
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3880 FOR 38600 P. PER LINE 50-50-50  
3890 FOR 38700 P. PER LINE 50-50-50  
3900 FOR 38800 P. PER LINE 50-50-50  
3910 FOR 38900 P. PER LINE 50-50-50  
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3970 FOR 39500 P. PER LINE 50-50-50  
3980 FOR 39600 P. PER LINE 50-50-50  
3990 FOR 39700 P. PER LINE 50-50-50  
4000 FOR 39800 P. PER LINE 50-50-50  
4010 FOR 39900 P. PER LINE 50-50-50  
4020 FOR 40000 P. PER LINE 50-50-50  
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4040 FOR 40200 P. PER LINE 50-50-50  
4050 FOR 40300 P. PER LINE 50-50-50  
4060 FOR 40400 P. PER LINE 50-50-50  
4070 FOR 40500 P. PER LINE 50-50-50  
4080 FOR 40600 P. PER LINE 50-50-50  
4090 FOR 40700 P. PER LINE 50-50-50  
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4110 FOR 40900 P. PER LINE 50-50-50  
4120 FOR 41000 P. PER LINE 50-50-50  
4130 FOR 41100 P. PER LINE 50-50-50  
4140 FOR 41200 P. PER LINE 50-50-50  
4150 FOR 41300 P. PER LINE 50-50-50  
4160 FOR 41400 P. PER LINE 50-50-50  
4170 FOR 41500 P. PER LINE 50-50-50  
4180 FOR 41600 P. PER LINE 50-50-50  
4190 FOR 41700 P. PER LINE 50-50-50  
4200 FOR 41800 P. PER LINE 50-50-50  
4210 FOR 41900 P. PER LINE 50-50-50  
4220 FOR 42000 P. PER LINE 50-50-50  
4230 FOR 42100 P. PER LINE 50-50-50  
4240 FOR 42200 P. PER LINE 50-50-50  
4250 FOR 42300 P. PER LINE 50-50-50  
4260 FOR 42400 P. PER LINE 50-50-50  
4270 FOR 42500 P. PER LINE 50-50-50  
4280 FOR 42600 P. PER LINE 50-50-50  
4290 FOR 42700 P. PER LINE 50-50-50  
4300 FOR 42800 P. PER LINE 50-50-50  
4310 FOR 42900 P. PER LINE 50-50-50  
4320 FOR 43000 P. PER LINE 50-50-50  
4330 FOR 43100 P. PER LINE 50-50-50  
4340 FOR 43200 P. PER LINE 50-50-50  
4350 FOR 43300 P. PER LINE 50-50-50  
4360 FOR 43400 P. PER LINE 50-50-50  
4370 FOR 43500 P. PER LINE 50-50-50  
4380 FOR 43600 P. PER LINE 50-50-50  
4390 FOR 43700 P. PER LINE 50-50-50  

```



|      |          |     |      |       |      |          |        |      |        |
|------|----------|-----|------|-------|------|----------|--------|------|--------|
| 48C3 | 0000     | T8  | ADDA | 010   | 48C4 | 0000     | F10    | LDH  | 0      |
| 48C5 | 0000     |     | ADDA | 05    | 48C6 | 00       |        | CLRA |        |
| 48C7 | 0000     | T5  | ADDA | 09    | 48C8 | 00       |        | COMB |        |
| 48C9 | 0000     |     | ADDA | 0C    | 48CA | 0000     |        | ADDB | 0100   |
| 48CB | 0000     | T0  | ADDA | 0E    | 48CC | 0017     |        | ADH  | P1     |
| 48CD | 0000     |     | ADDA | 0F    | 48CE | 0000     | 02     | LDH  | 0      |
| 48CF | 0000     | T7  | ADDA | 00    | 48D0 | 00       |        | COMB |        |
| 48D1 | 0000     |     | ADDA | 00    | 48D2 | 0000     |        | ADDB | 000    |
| 48D3 | 0000     | T8  | ADDA | 01    | 48D4 | 0010     |        | ADH  | P2     |
| 48D5 | 0000     |     | ADDA | 0010  | 48D6 | 0000     | 03     | LDH  | 0      |
| 48D7 | 000000   | 000 | LDH  | 000   | 48D8 | 00       |        | COMB |        |
| 48D9 | 0100     |     | ADDA | 00    | 48DA | 0000     |        | ADDB | 000    |
| 48DB | 0100     |     | ADDA | 00    | 48DC | 0011     |        | ADH  | P3     |
| 48DE | 00       |     | ADDA | 00    | 48DE | 0000     | 04     | LDH  | 0      |
| 48DF | 000000   |     | ADDA | 000   | 48E0 | 00       |        | COMB |        |
| 48E2 | 0000     |     | LDH  | 0100  | 48E3 | 0010     |        | ADDB | 010    |
| 48E4 | 000000   |     | ADDA | 000   | 48E6 | 0000     |        | ADH  | P4     |
| 48E7 | 0000     |     | LDH  | 010   | 48E8 | 0000     |        | ADDA | L20    |
| 48E9 | 000000   |     | ADDA | 01000 | 48EA | 0000     | F1     | ADDA | 0102   |
| 48EB | 001000   | ADH | ADDA | 01000 | 48EC | 0000     |        | ADH  | 00     |
| 48ED | 00000000 |     | LDH  | 0000  | 48EE | 0000     | F2     | ADDA | 000    |
| 48EF | 000000   |     | LDH  | 0000  | 48F0 | 0000     |        | ADH  | 00     |
| 48F1 | 000000   |     | LDH  | 0100  | 48F3 | 0000     | F3     | ADDA | 010    |
| 48F5 | 000000   |     | ADDA | 0100  | 48F6 | 0000     |        | ADH  | 00     |
| 48F9 | 00       |     | ADDA | 010   | 48FB | 0000     | F4     | ADDA | 00     |
| 48FA |          |     | ADDA | 0100  | 48FD | 0000     |        | ADDA | L20    |
| 48FB |          |     | ADDA | 0100  |      |          |        | LDH  | 0      |
| 48FC | 0000     |     | LDH  | 00    | 48FE | 00       |        | CLRA |        |
| 48FD | 000000   |     | ADDA | 0000  | 48FF | 00       |        | COMB |        |
| 48FF | 0000     |     | LDH  | 000   |      |          |        | ADDB | 00     |
| 4901 | 000000   |     | ADDA | 0000  | 4904 | 0000     | 02     | LDH  | 0      |
| 4906 | 0000     |     | LDH  | 010   | 4908 | 00       |        | COMB |        |
| 490A | 000000   |     | ADDA | 0000  | 490C | 0000     |        | ADDB | 00     |
| 490F | 000000   |     | LDH  | 010   | 4910 | 0000     |        | ADH  | 00     |
| 490C | 0000     |     | LDH  | 00    | 4916 | 0000     | 03     | LDH  | 0      |
| 490E | 000000   |     | ADDA | 000   | 491A | 0000     |        | ADDA | 00     |
| 4911 | 000000   |     | LDH  | 0000  | 491D | 0000     |        | ADH  | 00     |
| 4914 | 00000000 | L20 | LDH  | 0100  | 491F | 0000     | 04     | LDH  | 0      |
| 4916 | 000000   | L20 | LDH  | 0000  | 4920 | 0000     |        | ADDA | 00     |
| 4918 | 0100     |     | ADDA | 001   | 4921 | 00       |        | COMB |        |
| 491D | 00000000 |     | LDH  | 0000  | 4923 | 0000     |        | ADDB | 01     |
| 4921 | 000000   |     | ADDA | 0000  | 4924 | 0000     |        | ADH  | 00     |
| 4926 | 00000000 |     | LDH  | 0000  | 492A | 0000     |        | ADDA | L20    |
| 492B | 0000     |     | ADDA | 00    | 492C | 0000     | 06     | ADDA | 0102   |
| 492D | 0100     |     | ADDA | 00    | 492E | 0000     |        | ADH  | 00     |
| 492F | 0100     |     | ADDA | 00    | 4930 | 0000     | 02     | ADDA | 000    |
| 4931 | 000000   | L20 | ADDA | 0000  | 4933 | 0000     | 03     | ADDA | 010    |
| 4934 | 000000   |     | ADDA | 0000  | 4936 | 0000     |        | ADH  | 00     |
| 4937 | 000000   |     | LDH  | -010  | 4939 | 0000     | 04     | ADDA | 00     |
| 493A | 0100     |     | ADDA | 010   | 493C | 0000     |        | ADH  | 00     |
| 493D | 0000     |     | LDH  | 000   | 493F | 0000     | F0A    | LDH  | 000000 |
| 493E | 00       |     | ADDA | 000   | 4940 | 0000     |        | LDH  | 00     |
| 4942 | 000000   |     | ADDA | 000   | 4943 | 0000     | 000000 | LDH  | 00     |
| 4945 | 0000     |     | ADDA | 000   | 4946 | 0000     | 0000   | LDH  | 00     |
| 4947 | 0000     |     | LDH  | 00    | 4949 | 00       |        | ADDB | 0000   |
| 4949 | 000000   |     | ADDA | 000   | 494C | 0000     |        | ADH  | 0000   |
| 494C | 00000000 |     | ADDA | 0000  | 494F | 00       |        | ADH  | 00     |
| 4950 | 0000     |     | LDH  | 000   | 4953 | 00       |        | ADH  | 00     |
| 4952 | 000000   |     | ADDA | 0000  | 4956 | 00       |        | ADH  | 00     |
| 4958 | 000000   |     | ADDA | 000   | 4959 | 00000000 | 000000 | ADDA | 0000   |
| 495B | 000000   |     | ADDA | 0000  | 495C | 000000   |        | ADDA | 0000   |
| 495D | 00000000 | L20 | ADDA | 0000  | 495F | 0000     |        | ADDA | 0000   |
| 495F | 0000     |     | ADDA | 000   | 4960 | 0000     |        | ADDA | 0000   |
| 4961 | 000000   |     | ADDA | 0000  | 4963 | 0000     |        | ADDA | 0000   |
| 4964 | 000000   |     | ADDA | 0000  | 4966 | 0000     |        | ADDA | 0000   |

# Pamcodes

Part one of a new series on machine code for beginners by Pam D'Arcy.

HAVING volunteered to try and help R.J. Harding (Letters, September issue) and others like him, I have a couple of days before deadline and just one page to do, so you can imagine what you are going to get this month — a lot of waffle and no real detail. However, because the 'getting started' syndrome described in R.J. Harding's letter is often a big problem, I have included a few lines of assembler source code to see if we can all get going without wasting another month simply waiting for the first real article.

If you are trying to learn Dragon machine code for whatever reason, I will assume that you will already have:

- 1) at least one book on the subject
- 2) some form of assembler software.

Rather than dive in with a blow by blow account of machine code, which may of necessity leave you dangling mid-code from one long month to another, my intention will be to present a series of self-contained articles. Some of them will refer to programs from popular Dragon machine code books that people have had problems with, so that those of you who have those books in your possession, or want to get them, can go back later and tackle them with more confidence. This also gives the newcomers for you to jump me with examples you find difficult, which I may be able to write an article about.

## Lack of standards

Using the Dragon's Intel Basic, variables may be named or string, and are given alphanumeric names of any length — except that for various planned and very good reasons, these names are truncated within the Dragon to the first two characters when the Basic program is RUN. Thus variable names, for example, QUORUM1 and QUANTITY1 would both be treated as variable named QU, and hence any memory location would be used every time either variable QUORUM or QUANTITY (or any other variable commencing with the letters QU) was encountered when RUNNING a Basic program — which could account for some unexpected results...

```
10 QUORUM=10
20 PRINT MEMBERS
PRESENT QUANTITY
30 IF QUANTITY QUORUM THEN
PRINT QUORUM ELSE
PRINT COMMERCE MEETING
```

(That's as I would enter it — I never type in the word PRINT but always use the available shorthand/question mark form).

In a similar manner, Basic commands, or keywords, are replaced internally by a value, or token, that occupies a single byte of memory as the line of code is entered into the program (a procedure known as tokenising) — and tokenising when it is converted back for LISTing purposes, if any of the names of our variables commences with the same letters as a keyword,

Listing 1: To ensure a fair Basic program, 100 words

| Expected generated object code | Source code |        |          |         |
|--------------------------------|-------------|--------|----------|---------|
|                                | Line number | Letter | Mnemonic | Comment |
| 00 00                          | 00          | GO     | LOAD     | 0000    |
| 00 01                          | 01          |        | LDI      | 0001    |
| 00 02                          | 02          |        | LEAD     | 0002    |
| 00 03                          | 03          |        | STX      | 0003    |
| 00 04                          | 04          |        | STX      | 0004    |
| 00 05                          | 05          |        | STX      | 0005    |
| 00 06                          | 06          |        | STX      | 0006    |
| 00 07                          | 07          |        | STX      | 0007    |
| 00 08                          | 08          |        | STX      | 0008    |
| 00 09                          | 09          |        | STX      | 0009    |
| 00 10                          | 10          |        | RTS      |         |

the CRUNCH routine positively ruins our programming intention...

## 100 TOTAL=BALANCE+VALUE

It looks correctly because of the DEC RUNCH routine, but when attempting to RUN the program, TO of total and BAL, or value will be tokenised keywords that the Basic rightly says do not make sense, so it gives a syntax error.

Why have I taken this time out to go over what you probably know already about Dragon Basic when it is machine code that you are keen to get to grips with? In the same way that Dragon's Basic (and all other Basic) has its own quirks and rules, so do assemblers — and unfortunately there is no one-inbuilt assembler on the Dragon. Assembler as simply means to assemble, and a program that converts source code written according to ITS OWN rules, to object or machine code that it places (again, depending on its own rules) at its own or user specified addresses in memory. Apart from the fact that in general the 89 different types of source code instructions are represented by standard groups of letters, or mnemonics (memory joggers, as in GUS for SUBTRACT and GIVE for Branch Not Equal) and that preceding the mnemonic field is a line of source code will be a label field, and following the mnemonic will be an operand field, there are similarities between assemblers will end, making it impossible for anyone to present source code in a form suitable for input direct into all (or probably even most) assemblers produced for the Dragon. I shall therefore list the code as straightforward as possible so that minimum adjustment is needed for it to be immediately acceptable to your assembler.

## To rescue your Basic

I'll now include a few lines of source code for you to play with. There is no room to explain anything about this routine or its machine code this month, other than to say that once it has assembled correctly (perhaps save it to tape or disc at this point), too, if you type in an Intel Basic program to REM all copy; LIST it; type in NEW then LIST again — to, the Basic program has gone. EXERC the assembled routine from its start address and at OK, LIST again and the Basic program will have been restored to its former glory. It is also useful should you have an MO error on your only saved copy of a Basic program. Load in the machine code routine and EXERC it, and

the program lines as far as successfully read will be available to you. This routine can be found in Dragon User July 1983, page 44 and June 1984, page 29, and in the Dragon Programmers Reference Guide by John Vander Rooyen (Melbourne House), pages 107 — 108. Note the printing errors in the assembler listing on page 108 if you had trouble with it — a common enough problem that I shall deal with another time. The book is still available from Peacock.

## Assembly

There are two stages to assembly: source code input, or editing, and the assemble process itself, or generation of object or machine code. Your assembler may include its own editing facilities, or it may assemble source code statements entered using the Basic editor. Enter the source code according to your assembler's instructions and rules. Line numbers may or may not be needed. Using them when not required or vice versa is likely to cause every line token error. The label line 10 is not needed by the program itself, but is included in case it is mandatory in your assembler that the first instruction will be labelled. Your assembler may need an @ or other symbol to precede the label name. It may need the source code to be entered in particular columns of lines or fields, or may need to be separated by a specific character. The last line of source code may need a special value in the label or mnemonic field, hence any leaving a line number 80 there is remind you.

The assembler instructions should tell you where the object code will be placed in memory, which may depend on any CLEAR statement you type in before loading or running the assembler. The above program will run successfully from any address within the Dragon provided, obviously, that it is not loaded into areas occupied by the Basic program that is being recovered, nor into Basic's workspace. Reserved graphics pages and higher addressed memory reserved for machine code by using an appropriate CLEAR statement are idea areas. With routines like this that uses a routine within the 32K Basic ROM, line 25 (Dragon 64 owners who would want to use the routine in 64K mode will need to add 14000 to the operand).

JSR SCORF

with correspondingly different object code being produced.

# Motorbiking

*Richard Boryna catches his buses in arcade style.*

THIS is a version of the arcade game where you control an intrepid biker as he escapes over buses. You start with four motorbikes and five buses to jump, building up to twelve if you can manage it. To land successfully you have to reach the top two-thirds of the down ramp. Bikes are wrecked by jumping too far, not far enough or going too fast and flipping the bike over.

The right-hand joystick is used and an analogue joystick is needed to give proportional control. When it is centred you will have a slight forward velocity. Pull back to slow or stop and push forwards to accelerate. To start your run up, press the fire button.

The engine noise is interrupt driven by

re-routing the IRQ interrupt by altering the address at location 366076. This has to be done by loading the new address from cassette while the interrupt is disabled, so storing it from inside the program can have disastrous results. This is why the first time the game is run the cassette recorder 'play' button must be left down.

To enter the program type in the BASIC listing and test it, first making line 380 a REM statement. When it is running properly and the data in lines 100-190 has been checked, remove the REM from line 380 and C&W's the program. You will not have sound this time.

Once done, enter the following:

POKE 170,07  
POKE 170,93

Then, with the tape directly after the main program, enter:

C&W'S "M", 070, 070, 070

The game can then be re-loaded and run, this time with sound. Before loading anything else, turn the computer off as the engine noise routine will corrupt any other saved such as PLAY or SOUND commands.

If you can't face typing the listing in, 12-75 to me at 71 Caxsey Drive, Hellingborough, Northants. H&H 3-77 will get you a couple of copies on tape.

```
100 * *****
101 * *****
102 * == BILBO BILBO ==
103 * == BILBO BILBO ==
104 * == BILBO BILBO ==
105 * == BILBO BILBO ==
106 * *****
107 * *****
108 * ==
109 * *****
110 * *****
111 * *****
112 * *****
113 * *****
114 * *****
115 * *****
116 * *****
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119 * *****
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[illegible]

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1710 *****
1720 SP=SP+1:SP=1:SP,VP)=(XP-7,VP-7),BL,0
1730 FOR I=SP+1 TO SP: GET SP=I
1740 PUT I,SP,VP)=(SP-7,VP-7),BL,PUT I,SP=1:SP=VP-2
1750 GET I,SP,VP)=(XP-7,VP-7),BL,0
1760 PUT I,SP,VP)=(XP-6,VP-6),BL,0
1770 FORM1=1:TO(24)=P+2:END
1780 END
1790 X1=XP+1:Y1=Y
1800 *****
1810 *** LEFT: GET ***
1820 *****
1830 L=256:256=SP:256=SP+1
1840 SP=0,0:VP=0:256=0:256=0:256=0:256=0
1850 VP=SP+1:1:256:2:1:256:2:256:1
1860 VP=0:VP
1870 IF SP=0: GET: END:SP=0: VP=0
1880 PUT I,SP,VP)=(SP-7,VP-7),BL,0:VP=0
1890 IF SP=1: THEN:256:BL:IF (SP=0:SP=1) AND (VP=0:VP=1): THEN:256
1900 IF SP=1:256:1:END:1:0
1910 IF SP=0: THEN:1:0
1920 GET I,SP,VP)=(XP-6,VP-6),BL,0
1930 PUT I,SP,VP)=(XP-6,VP-6),BL,0
1940 X1=XP+1:Y1=Y
1950 GET I,1:40
1960 *****
1970 *** SUB: TOP: L=256:1:0 ***
1980 *****
1990 PUT I,SP,VP)=(XP-6,VP-6),BL,0:VP=0
2000 PUT I,SP,VP)=(XP-7,VP-7),BL,0
2010 GET I,256:0
2020 *****
2030 *** SUB:SUB: L=256:1:0 ***
2040 *****
2050 VP=1:VP
2060 SP=0:0
2070 GET I,SP,VP)=(XP-6,VP-6),BL,0
2080 FOR I=SP+1 TO SP:256:GET SP=I
2090 PUT I,SP,VP)=(XP-6,VP-6),BL,0:PUT
2100 VP=VP+1:0:VP
2110 GET I,SP,VP)=(XP-6,VP-6),BL,0
2120 PUT I,SP,VP)=(XP-6,VP-6),BL,0
2130 FORM1=0:TO(24)=0:END
2140 END
2150 PUT I,SP,VP)=(XP-6,VP-6),BL,0:VP=0
2160 SP=0:0:0:0:0:0
2170 GET I,SP,VP)=(XP-6,VP-6),BL,0
2180 PUT I,SP,VP)=(XP-6,VP-6),BL,0:PUT
2190 IF SP=1: THEN:1:0
2200 PUT I,SP,VP)=(XP-6,VP-6),BL,0:PUT
2210 SP=SP+1
2220 GET I,SP,VP)=(XP-6,VP-6),BL,0
2230 PUT I,SP,VP)=(XP-6,VP-6),BL,0
2240 FORM1=0:TO(24)=0:END
2250 END
2260 FOR I=1 TO 256:END:1:0:TO(24)=0
2270 *****
2280 *** OVER:END:0 ***
2290 *****
2300 SP=SP-1:IF SP=0: THEN:SP=0
2310 VP=0
2320 GET I,SP,VP)=(XP-6,VP-6),BL,0
2330 PUT I,SP,VP)=(XP-6,VP-6),BL,0
2340 FORM1=0:TO(24)=0:END
2350 PUT I,SP,VP)=(XP-6,VP-6),BL,0:PUT
2360 SP=SP-1:IF SP=0: THEN:SP=0
2370 VP=0
2380 GET I,SP,VP)=(XP-6,VP-6),BL,0
2390 PUT I,SP,VP)=(XP-6,VP-6),BL,0:VP=0
2400 FORM1=0:TO(24)=0:END
2410 PUT I,SP,VP)=(XP-6,VP-6),BL,0:VP=0
2420 PUT I,SP,VP)=(XP-7,VP-7),BL,0
2430 *****
2440 *** END:1:0 ***
2450 *****
2460 FORM1=0:TO(24)=0:END
2470 FORM1=0:TO(24)=0:END

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[illegible]

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20440 GET X(1,0)=1,0,0,0,0,0,0,0
20450 PCLB=128+128*128+128*128
20460 FORM=1 T00
20470 FORM=1 T01 001P=0
20480 READA=PRINT(X,Y,A)
20490 NEXT Y
20500 GET X(1,0)=1,0,0,0,0,0,0,0
20510 PCLB
20520 FORM=1 T00
20530 FORM=1 T01
20540 READA=PRINT(X,Y,A)
20550 NEXT Y
20560 GET X(1,0)=1,0,0,0,0,0,0,0
20570 PCLB
20580 FORM=1 T00
20590 FORM=1 T01
20600 READA=PRINT(X,Y,A)
20610 NEXT Y
20620 GET X(1,0)=1,0,0,0,0,0,0,0
20630 PCLB
20640 FORM=1 T00
20650 FORM=1 T01
20660 READA=PRINT(X,Y,A)
20670 NEXT Y
20680 GET X(1,0)=1,0,0,0,0,0,0,0
20690 PCLB
20700 FORM=1 T00
20710 FORM=1 T01
20720 READA=PRINT(X,Y,A)
20730 NEXT Y
20740 GET X(1,0)=1,0,0,0,0,0,0,0
20750 PCLB
20760 FORM=1 T00
20770 FORM=1 T01
20780 READA=PRINT(X,Y,A)
20790 NEXT Y
20800 GET X(1,0)=1,0,0,0,0,0,0,0
20810 PCLB
20820 FORM=1 T00
20830 FORM=1 T01
20840 READA=PRINT(X,Y,A)
20850 NEXT Y
20860 GET X(1,0)=1,0,0,0,0,0,0,0
20870 PCLB
20880 FORM=1 T00
20890 FORM=1 T01
20900 READA=PRINT(X,Y,A)
20910 NEXT Y
20920 GET X(1,0)=1,0,0,0,0,0,0,0
20930 PCLB
20940 FORM=1 T00
20950 FORM=1 T01
20960 READA=PRINT(X,Y,A)
20970 NEXT Y
20980 GET X(1,0)=1,0,0,0,0,0,0,0
20990 PCLB
21000 FORM=1 T00
21010 FORM=1 T01
21020 READA=PRINT(X,Y,A)
21030 NEXT Y
21040 GET X(1,0)=1,0,0,0,0,0,0,0
21050 PCLB
21060 FORM=1 T00
21070 FORM=1 T01
21080 READA=PRINT(X,Y,A)
21090 NEXT Y
21100 GET X(1,0)=1,0,0,0,0,0,0,0
21110 PCLB
21120 FORM=1 T00
21130 FORM=1 T01
21140 READA=PRINT(X,Y,A)
21150 NEXT Y
21160 GET X(1,0)=1,0,0,0,0,0,0,0
21170 PCLB
21180 FORM=1 T00
21190 FORM=1 T01
21200 READA=PRINT(X,Y,A)
21210 NEXT Y
21220 GET X(1,0)=1,0,0,0,0,0,0,0
21230 PCLB
21240 FORM=1 T00
21250 FORM=1 T01
21260 READA=PRINT(X,Y,A)
21270 NEXT Y
21280 GET X(1,0)=1,0,0,0,0,0,0,0
21290 PCLB
21300 FORM=1 T00
21310 FORM=1 T01
21320 READA=PRINT(X,Y,A)
21330 NEXT Y
21340 GET X(1,0)=1,0,0,0,0,0,0,0
21350 PCLB
21360 FORM=1 T00
21370 FORM=1 T01
21380 READA=PRINT(X,Y,A)
21390 NEXT Y
21400 GET X(1,0)=1,0,0,0,0,0,0,0
21410 PCLB
21420 FORM=1 T00
21430 FORM=1 T01
21440 READA=PRINT(X,Y,A)
21450 NEXT Y
21460 GET X(1,0)=1,0,0,0,0,0,0,0
21470 PCLB
21480 FORM=1 T00
21490 FORM=1 T01
21500 READA=PRINT(X,Y,A)
21510 NEXT Y
21520 GET X(1,0)=1,0,0,0,0,0,0,0
21530 PCLB
21540 FORM=1 T00
21550 FORM=1 T01
21560 READA=PRINT(X,Y,A)
21570 NEXT Y
21580 GET X(1,0)=1,0,0,0,0,0,0,0
21590 PCLB
21600 FORM=1 T00
21610 FORM=1 T01
21620 READA=PRINT(X,Y,A)
21630 NEXT Y
21640 GET X(1,0)=1,0,0,0,0,0,0,0
21650 PCLB
21660 FORM=1 T00
21670 FORM=1 T01
21680 READA=PRINT(X,Y,A)
21690 NEXT Y
21700 GET X(1,0)=1,0,0,0,0,0,0,0
21710 PCLB
21720 FORM=1 T00
21730 FORM=1 T01
21740 READA=PRINT(X,Y,A)
21750 NEXT Y
21760 GET X(1,0)=1,0,0,0,0,0,0,0
21770 PCLB
21780 FORM=1 T00
21790 FORM=1 T01
21800 READA=PRINT(X,Y,A)
21810 NEXT Y
21820 GET X(1,0)=1,0,0,0,0,0,0,0
21830 PCLB
21840 FORM=1 T00
21850 FORM=1 T01
21860 READA=PRINT(X,Y,A)
21870 NEXT Y
21880 GET X(1,0)=1,0,0,0,0,0,0,0
21890 PCLB
21900 FORM=1 T00
21910 FORM=1 T01
21920 READA=PRINT(X,Y,A)
21930 NEXT Y
21940 GET X(1,0)=1,0,0,0,0,0,0,0
21950 PCLB
21960 FORM=1 T00
21970 FORM=1 T01
21980 READA=PRINT(X,Y,A)
21990 NEXT Y
22000 GET X(1,0)=1,0,0,0,0,0,0,0
22010 PCLB
22020 FORM=1 T00
22030 FORM=1 T01
22040 READA=PRINT(X,Y,A)
22050 NEXT Y
22060 GET X(1,0)=1,0,0,0,0,0,0,0
22070 PCLB
22080 FORM=1 T00
22090 FORM=1 T01
22100 READA=PRINT(X,Y,A)
22110 NEXT Y
22120 GET X(1,0)=1,0,0,0,0,0,0,0
22130 PCLB
22140 FORM=1 T00
22150 FORM=1 T01
22160 READA=PRINT(X,Y,A)
22170 NEXT Y
22180 GET X(1,0)=1,0,0,0,0,0,0,0
22190 PCLB
22200 FORM=1 T00
22210 FORM=1 T01
22220 READA=PRINT(X,Y,A)
22230 NEXT Y
22240 GET X(1,0)=1,0,0,0,0,0,0,0
22250 PCLB
22260 FORM=1 T00
22270 FORM=1 T01
22280 READA=PRINT(X,Y,A)
22290 NEXT Y
22300 GET X(1,0)=1,0,0,0,0,0,0,0
22310 PCLB
22320 FORM=1 T00
22330 FORM=1 T01
22340 READA=PRINT(X,Y,A)
22350 NEXT Y
22360 GET X(1,0)=1,0,0,0,0,0,0,0
22370 PCLB
22380 FORM=1 T00
22390 FORM=1 T01
22400 READA=PRINT(X,Y,A)
22410 NEXT Y
22420 GET X(1,0)=1,0,0,0,0,0,0,0
22430 PCLB
22440 FORM=1 T00
22450 FORM=1 T01
22460 READA=PRINT(X,Y,A)
22470 NEXT Y
22480 GET X(1,0)=1,0,0,0,0,0,0,0
22490 PCLB
22500 FORM=1 T00
22510 FORM=1 T01
22520 READA=PRINT(X,Y,A)
22530 NEXT Y
22540 GET X(1,0)=1,0,0,0,0,0,0,0
22550 PCLB
22560 FORM=1 T00
22570 FORM=1 T01
22580 READA=PRINT(X,Y,A)
22590 NEXT Y
22600 GET X(1,0)=1,0,0,0,0,0,0,0
22610 PCLB
22620 FORM=1 T00
22630 FORM=1 T01
22640 READA=PRINT(X,Y,A)
22650 NEXT Y
22660 GET X(1,0)=1,0,0,0,0,0,0,0
22670 PCLB
22680 FORM=1 T00
22690 FORM=1 T01
22700 READA=PRINT(X,Y,A)
22710 NEXT Y
22720 GET X(1,0)=1,0,0,0,0,0,0,0
22730 PCLB
22740 FORM=1 T00
22750 FORM=1 T01
22760 READA=PRINT(X,Y,A)
22770 NEXT Y
22780 GET X(1,0)=1,0,0,0,0,0,0,0
22790 PCLB
22800 FORM=1 T00
22810 FORM=1 T01
22820 READA=PRINT(X,Y,A)
22830 NEXT Y
22840 GET X(1,0)=1,0,0,0,0,0,0,0
22850 PCLB
22860 FORM=1 T00
22870 FORM=1 T01
22880 READA=PRINT(X,Y,A)
22890 NEXT Y
22900 GET X(1,0)=1,0,0,0,0,0,0,0
22910 PCLB
22920 FORM=1 T00
22930 FORM=1 T01
22940 READA=PRINT(X,Y,A)
22950 NEXT Y
22960 GET X(1,0)=1,0,0,0,0,0,0,0
22970 PCLB
22980 FORM=1 T00
22990 FORM=1 T01
23000 READA=PRINT(X,Y,A)
23010 NEXT Y
23020 GET X(1,0)=1,0,0,0,0,0,0,0
23030 PCLB
23040 FORM=1 T00
23050 FORM=1 T01
23060 READA=PRINT(X,Y,A)
23070 NEXT Y
23080 GET X(1,0)=1,0,0,0,0,0,0,0
23090 PCLB
23100 FORM=1 T00
23110 FORM=1 T01
23120 READA=PRINT(X,Y,A)
23130 NEXT Y
23140 GET X(1,0)=1,0,0,0,0,0,0,0
23150 PCLB
23160 FORM=1 T00
23170 FORM=1 T01
23180 READA=PRINT(X,Y,A)
23190 NEXT Y
23200 GET X(1,0)=1,0,0,0,0,0,0,0
23210 PCLB
23220 FORM=1 T00
23230 FORM=1 T01
23240 READA=PRINT(X,Y,A)
23250 NEXT Y
23260 GET X(1,0)=1,0,0,0,0,0,0,0
23270 PCLB
23280 FORM=1 T00
23290 FORM=1 T01
23300 READA=PRINT(X,Y,A)
23310 NEXT Y
23320 GET X(1,0)=1,0,0,0,0,0,0,0
23330 PCLB
23340 FORM=1 T00
23350 FORM=1 T01
23360 READA=PRINT(X,Y,A)
23370 NEXT Y
```

[illegible]

# Interrupt driven sound

When does an interrupt produce a continuous sound? Gareth Fenton explains.

PI 'Dragon Answers' in a recent issue of Dragon User it was asked if it is possible to produce sound that would play continuously while a program runs (as in *Cozy Painter* and the like). The following program is my solution to this problem and works by using the Dragon's IRQ (Interrupt Request) interrupt.

To enter the program, type in the loading program (Listing one) and RUN it. If there is an error in the data you will be advised accordingly, and in which line the error lies. Once it is successfully entered, save the data, as a crash caused by any incorrectly typed numbers, could result in complete loss of control of your computer, the only course open to you being to switch off and start again.

To use the (saved) program, use the command EXEC 84H7500.0. The value of n will determine what of the three functions is to be used.

The options are summarised in the following table:

```
EXEC 84H7500.1 SWITCH TUNE OFF
EXEC 84H7500.1 SWITCH TUNE ON
EXEC 84H7500.2 DEFINE NEW TUNE
```

The option 'Define new tune' needs some further explanation. To create the tune to be played use the format:

```
EXEC 84H7500.2:notes (separated by a comma)
```

The number used for each note is the same as that used by the Dragon's SOUND command. For example, as mentioned in the manual, SOUND 89.1 will play Middle C for a short duration. EXEC 84H7500.2:89.1 will play Middle C repeatedly until the sound series is changed or until EXEC 84H7500.2 is entered.

In order to avoid slowing the 'load' program the note produced is very short. Therefore it may be necessary to repeat the note to make it appear longer.

If you make an error in the definition of a new sound series, a new error message 'PS: ERROR (Fenton Sound)' will be displayed and any tune currently being played will be switched off. Also, any error in

a Basic program which uses this program will automatically switch the tone off as well. The defined series of notes must be less than 255 — the PS error will result if you attempt to define any further notes.

To make a short pause in the tune, the number 255 should be used instead of a note value. The program will accept a variable instead of a number so, by using P=255, the variable P can be used to represent a pause in the same way, other variables can be used instead of notes, for example C=89 defines variable C as middle C.

A point to remember is that the interrupt driven sound must be switched off (using EXEC 84H7500.1) before using the SOUND or PLAY commands.

That is all the information you require to use the program, from Basic. If you wish to use it from a machine code program or are interested in finding out how it works, the complete assembler listing is included and the rest of this article is devoted to its explanation.

As I have already mentioned, the program works by using the Dragon's IRQ interrupt, which occurs every 1/60th of a second. As well as being used to update the basic TIMER, it is also involved in synchronising the video output to the 'frame flyback' of the TV set and so must be used with care.

In order for the program to work, the IRQ vector (the address the IRQ jumps to fifty times a second) must be changed to point to a dispatch routine which calls the new program and then jumps to the ROM routine to handle the interrupt. The vector at \$100 is changed to point to @JUMPER, the new dispatch routine, by the routine @SWITCHON. It is reset to its normal value of \$8000 by the routine @SWITCHOFF.

While it is possible to change the IRQ vector to point to your own routines directly from Basic, it is not advisable as you could well end up losing any programs currently stored in memory. It is better to use a machine language routine as I have done — it is much faster, although the IRQ should normally be left alone unless you are sure what you are doing.

Another important part of the program is

the routine which actually makes the sound (@SOUNDS). This makes use of the ROM routine (at address 4775) which sounds a beep for the length in the B register of the pitch stored in location 180 (see SRC).

In Basic, the IRQ interrupts the playing of notes, resulting in the 'trailing' that is particularly audible during high notes. To produce a cleaner note, it is necessary to turn off or mask the interrupts. This is done by logically OR'ing the condition code register with 15; they are re-enabled by AND'ing the CCR with 255. Unfortunately, this cannot be done from BASIC because the SOUND and PLAY commands use the interrupts to determine how long to play each note. With interrupts disabled, the first note will play indefinitely. To get round this problem, the program has @SOUND set up to make the notes independently of the IRQ, which is then disabled. This is done by the subroutines @SNDP in the assembler listing.

The routine @COMMAND determines which option has been selected. It makes use of two ROM routines. The first, @CCOM, checks that the next character in the command buffer is a comma (signifying as it is and causing a syntax error if not). The second routine is @CETRUM which will return the number of variables in the command buffer as an eight bit value in the B register, causing a function error if the character is not a number or variable name (or is greater than 255).

In order to use this program from your own machine language programs, the routines @SWITCHON and @SWITCHOFF can be called directly. The note values can be stored directly in the sound buffer pointed to by @SOUNDADDR, remembering to terminate the string with a zero byte. As is the case when using this program from Basic, a byte value of 255 (FFF) will cause a short pause.

The length of each note played can be altered by storing an alternative value at @PLOOP. This is originally set to 10 and I suggest that if you do change it, you keep the value fairly small as otherwise it will slow down the program too much.

My thanks to Brian Cudge for his very useful Formaseries which details some of the ROM routines used in this program.

## Listing 1

```
10 'INTERRUPT DRIVEN SOUND
20 'LOADING PROGRAM
30 FOR A=84H7500 TO 84H7F9F STEP 16
40 BLK=BLK+1
50 LC=0
60 FOR L=0 TO 15
70 EXEC=8888

80 READ A$
90 B=VAL("H"+A$)
100 POKE A+L,B
110 C=C+B
120 LD=LD+B
130 NEXT L
140 READ D
```



# Winners and Losers

Every month  
Gordon Lee will  
look at some prize programming

MULTIPLES of 17 were the name of the game in the June competition — the problem being to find the longest possible sequence (or sequences) of multiples such that each number in the sequence must begin with the same three digits in the order that end the preceding number.

The solution, as given in Dragon User, lists two sequences of eight numbers in each. These are shown below, the number in brackets indicating the multiple of 17 at each step.

|      |       |      |       |
|------|-------|------|-------|
| 9999 | (530) | 9994 | (588) |
| 9992 | (58)  | 9942 | (589) |
| 9928 | (558) | 9422 | (585) |
| 9282 | (308) | 4222 | (385) |
| 2822 | (118) | 2227 | (131) |
| 8228 | (14)  | 2278 | (134) |
| 2288 | (142) | 2788 | (164) |
| 3888 | (224) | 7888 | (464) |

Each of these series ends when the final three digits of the last number cannot represent the first three digits of a multiple of seventeen, in the cases above 888 and 888. For example, to take the first of these numbers, the next lowest multiple of 17 that would begin the required range (9975), with the ones above being 8082. Thus, all values in the eight thousand and eighties have been "jumped".

These were the results given, but a number of readers came up with a third sequence of eight values commencing with the digits 9901:

|      |       |
|------|-------|
| 9901 | (53)  |
| 9916 | (538) |
| 9162 | (4)   |
| 1628 | (62)  |
| 6284 | (12)  |
| 2840 | (128) |
| 8408 | (24)  |
| 4080 | (242) |



The acceptance of this as a valid answer depends on the "leading zero" issue. Philip Beed of Gosport was one of the entrants who picked up this particular point. He writes:

"A simple test for my program was to use the value you gave to check my results against your own, however, with my first program I got different results even though my program seemed correct. Closer examination revealed that you had included a three digit multiple with a leading zero! So I also included all multiples which could be made four digit by adding leading zeros. This gave me three winning results,

only one of which contained no leading zero multiples. I feel there should be only one answer, so I pick this one, especially as you say in January that leading zeros are not usually allowed unless specified, and you did not specify it but implied it by including one in your example? I took lowest total answer to the leading zero question."

So the question is, do we allow no leading zeros in which case there is no one solution (9994 at seq. 1), or we allow leading zeros but not in the initial number (giving two solutions, 9995 and 9994), or do we allow unrestricted use of leading zeros to give us three solutions (9991, 9995 and 9994)?

In retrospect, the first option (producing a single unique solution) would, as mentioned by Mr. Beed, be the most satisfactory — although it was the second option which I had in mind when devising the question. However, fear not. As the question as set contained this ambiguity, all three approaches were considered in selecting the prizewinner. Last in case anyone gets the wrong idea, all the prizewinners had produced either the first two solutions, or all three, but no extra points were added for getting the third option, and nobody at all came up with justifications for and there, or one and three, because all of you were aware of the leading zero question and had either deliberately included it or deliberately excluded it, either way the programming required was of the same caliber — 3.01.

However, all of this was in danger of being made irrelevant by one solution claiming a sequence of sixteen (yes, sixteen!) numbers. The relevant part of the listing which accompanied this entry is given here, and it provides an interesting exercise in "reversal" programming.

Can you spot just what the program does and where the programmer went wrong? I'll give you my solution next month.

```

10 REM SEVENTEENS
20 FOR I=1 TO 999
30 L=1:X=I*10
40 R=X-17*INT(X/17)
50 IF R<10 THEN L=L+1:X=10*
  (VAL(RIGHT$(STR$(X),3)))+R:
  GOTO 40 ELSE IF L>M THEN M=L:N=I
60 NEXT I
70 PRINT"The longest sequence starts
  at";STR$(M);", and is";
  STR$(M);" numbers long":END

```



# Dragon Answers

If you've got a technical question write to Brian Cadogan. Please do not send a SAE as Brian cannot guarantee to answer individual inquiries.

## A basic problem

AS well as my Dragon I also use an Amstrad PC at which I use Commodore Software's Basic 2. While comparing the same across the control structures which I would like to add to the Dragon's Basic, as this several advantages over Basic 2. These are the WHILE...NEXT and REPEAT...UNTIL loops.

Could you please give a simple explanation of how this can be achieved in Dragon Basic?

Adrian Durr  
24 Woodstock Close  
Petersley  
Stirling

It is possible to simulate the control structures you mention using just the G-TO and GOTO commands, as follows:

### Structured Basic:

```
WHILE X < Y DO
```

```
...  
Program statements
```

```
WEND
```

### Dragon Basic:

```
100 IF NOT (X<Y) THEN 180  
110 ...  
120 Program statements  
130 GOTO 180  
140 180 end of loop
```

### Structured Basic:

```
REPEAT
```

```
...  
Program statements
```

```
UNTIL X=Y
```

### Dragon Basic:

```
100 180 start of loop  
110 ...  
120 Program statements  
130 140  
150 IF NOT (X=Y) THEN 100  
160 180 end of loop
```

And take a look at BASIC42 from Harris Micro Software with the optional STRUCTURE utility. This will add these control structures directly to the Dragon's vocabulary. Harris can be contacted on 01 540 8035.



## Disc drive error

I am writing to ask your help concerning a problem I have with a disc drive. The interface I am using is the SuperDisk from PDP. The problem is that the interface sector or comes up irrespective of the tabbing open or closed, so that I cannot format the disc. I have no information on the disc (a Mitsubishi) so I would appreciate your comments please.

David Coag  
2 Woodstock Close  
North Road  
Concord, Angus

Assuming that the drive you are using is wired correctly to the interface, is the motor noisy and stops, and the lamp light works as expected? The problem would seem to be with the write protect line which is pin 28 on the interface.

You can check this by connecting a voltmeter between pins 28 and 1 (or any odd numbered pins which is grounded). Try inserting a write protected disc and a non-write protected disc. The reading should switch between +5V and 0V. If you cannot get such a reading, then the drive is probably at fault.

If all seems well with the drive, then the interface may be at fault, so bypassing PDP directly on 0273 514761 for advice.

## Tokenised

PLEASE could you tell me where in the Dragon 32's memory the tokenised Basic program is stored and how to access it. The information I have requires an OS800 to STTY, but when I peek these locations I get a continuation of zeros.

Craig Henderson  
26 Woodbury Avenue  
Dunfermline  
Dumfries

WHERE the tokenised Basic program is actually stored in RAM depends on several things, such as the number of graphics pages reserved and whether OS8 is attached or not. You can find the start address of the current Basic program by peaking locations 25 and 26, that:

```
START=PEEK(25)*256+PEEK(26)
```

The end of the program can be found by peaking locations 27 and 28 (which point to the start of the variable table):

```
END=PEEK(27)*256+PEEK(28)
```

The actual format of the tokenised Basic is quite complicated, and I won't go into it here. Suffice it to say that command and function words are replaced by a single byte in the range 128.

## Which modem, where?

I own a Dragon 32 (without disc drive) and would like to buy a 1200/15 modem for use with my machine. Could you tell me of a stocked for the store and the cost?

Alister Scott  
24 Marshall Grove  
Almondbank  
Glasgow

If you intend to use a Dragon 32 with a modem, you will find at all need an RS232C interface. These are available from several suppliers, but do not come cheap, and software may be a problem for the modem you eventually then buy. Your best solution would probably be to pick up a second hand (or discounted) Dragon 64 machine and buy the Hayes Electronics Print Modem 3000 package (£45). They can be contacted at 30 Laurel Drive, Wiltshire, South Wales.

## Trying for black and white

I AM trying to get my Dragon to run on a black and white monitor, but unfortunately the Dragon appears only to be set up to run on a colour monitor. Can you tell me how to obtain a signal to make a black and white monitor work?

Chris Hudson  
4 Wyndham Road  
Dunfermline  
South 025 5943

The Dragon's monitor socket supplies composite video (PAL) and sound on pins 1 and 2 respectively (pin 2 is ground). The signal is compatible with monochrome monitors with an impedance of 75 ohms. As you do not say what monitor you are using I can only suggest that you check you have connected the correct pins, and that the monitor is compatible with the above information.



# Write: ADVENTURE

Peter Gernand adds verbs to your adventure

As promised at the end of last month's article, this month we'll be tackling the relatively important point of adding verbs to your adventures, and also introducing characters.

Adding verbs is a fairly straightforward task, and since our parser always (if it recognizes a verb) returns a value associated with that particular verb, we can then add something like:

```
1000 IF VB = 32 THEN 2360
```

or whatever, always knowing that the value of course can be the:

```
1000 ON VB GOTO ...
```

command to take up less space.

Assuming that we do that, we then need to introduce the characters. The thing that we're using this month comes from an adventure that I have recently completed writing. One of the characters in it is a wizard of great legend, a chap called Strombringer the Gray, and he is there to help you in your quest. We'll assume that you've included in your program a line 1000 mentioned earlier, so that the wizard has appeared.

Now then, the syntax which the player is instructed to use in this game, when he's talking to characters that is, takes the form: SAY TO (CHARACTER) "DO SOMETHING". That is, assuming one were talking to our wizard friend and wanted him to GO EAST, one would enter SAY TO STROMBRINGER "GO EAST", and this is what we have to work on.

There are other things that can be said, magic words, and for these the player is told that he has to use the syntax SAY "MAGIC WORD". Bearing these things in mind, take a look at the listing.

Therefore, however other things that the player can say to the program, and this involves making the two magic words that the program will recognize. These are sorted out in lines 2360 and 2361, and if

either of the two verbs are said (as in SAY "POTZ" or SAY "TERLEY") then program control goes off to two different routines. These just determine whether or not the player is in the correct location for the words to have any effect.

From now on we know that the player is trying to talk to someone, or something, and the rest of the routine is used to sort all this out. Lines 2362 and 2364 determine where the quotation marks appear in the player's input, which then gives us a variable 'told'. Thus if the player typed in SAY TO STROMBRINGER "CAST A SPELL", then 'told' would contain "CAST A SPELL", leaving the rest of the string untouched. If, however, the program fails to find any quotation marks (CHRONO by theory) then program execution goes off to line 2364 to print up a suitable response for what this procedure considers to be a conversational input.

Having found out what we're saying we then have to find out who we're saying it to, and this is the purpose of the first part of the line 2365, which gives us 'name' to contain the name of the person being addressed. If, by any chance, the player were to type in SAY TO ME "HELLO" the program would then respond with "HELLO". There, satisfied? Before going back off to line 10 to get another input, if the player isn't talking to Strombringer, then line 2367 sends execution careening off to line 2368, which we'll come to later.

Now we know what the player is trying to say and that he's trying to say it to Strombringer. So, line 2368 checks to see if the wizard can hear to attempt to carry out the task set before him, and if he can't then the program kindly informs the player of this fact before going off to line 10 again.

Line 2369 is the start of the main chunk of code for this particular verb, and you'll note that the initial thing that it does is to set the 'a' variable to 0, indicating that Strombringer has been spoken to and that he can also print for the pub for a while if you don't give him anything to do to him, reasonably enough, gets bored. Then, if the player has typed in SAY TO STROMBRINGER "FOLLOW ME" the old wizard politely complains that he's here, and we go to line 10 again, which is the particular game is our main control line for the program. All being well, this does keep the wizard by you longer.

Line 2388 is used to tell the player that the syntax is okay to be that he's the wizard is thinking about it, and then it sets up a little delay using line 2428 (it's just FOR I=1 TO 1000 NEXT RETURN). Lines 2391 and 2392 are a miniature parser, and they attempt to unravel the player's request by splitting it up into a verb and a noun. If the player has only entered one word, line 2393 prints up message number 150, which is something to the effect that the



wizard doesn't understand one word requests and you'll have to type in something else. These messages are all printed out via the subroutines at line 2390, which simply addresses a file number and prints up on the screen the right message. And, having said that, immediate apologies for using upper and lower case in the listing, but alas my Dragon is not equipped to list out things. Just, as ever, use upper case all the time.

Anyway, there's really only two things the wizard can do, those being to GO somewhere and to CAST a spell, so either of these are the case we go to line 2387 and 2390 respectively. Otherwise, another miniature parser comes into play and line 2395 to 2398 sort out what verb has been entered. If it's a recognized one then we carry on, otherwise print out a message that the wizard is not going to comply and shoot off to line 10. If it is a known verb, and it happens to be verb number 19, 20 or 21 (these being GET, TAKE and CARRY), then a message about the wizard's being asked by his mother to be a cadoodle is printed up. Verb 14, OPEN, gives you a "Get yourself" message, but if some of these conditions are met then the stock message about not complying is used and we retreat, as always, to line 10.

Lines 2399 to 2398 are all about casting a spell, and if the player hasn't typed in CAST A SPELL or CAST SPELL then line 2399 sends him packing with a suitable message. You've got to be in room 29 for the wizard to be able to cast a spell anyway, which is what line 2381 sorts out, and you can't be greedy and have more than one cast for you, which is what line 2393 does.

Lines 2399 to 2398 concern themselves with the number of times that the wizard has visited the pub, and if he hasn't ever been there after your initial meeting then his hands are shaking and he can't do it, if he's been there more than four times then he's too drunk to cope, but all being well he'll cast a spell and open up a new route for you. Thus we increment the score, set the cast spell variable 'ca' and change our



map of the game by altering P44(37.5) to equal 38; this, as you may recall, will allow the player to go south from location 37 to location 38. As location 38 cannot be visited until this is done, we have already set P44(38.1) to equal 37, allowing the player to go out again. Line 2385 is just a theatrical effect.

Now onto the other main reason for Strondbolger's presence, and that's death with by lines 2387 to 2388. Without giving away the problem, you basically have to get the old boy to go east at one point,



because if you go east you encounter difficulties. Being a wizard, however, Strondbolger can sort things out much better than you can. Bearing that in mind, line 2387 checks to see that the player is specifying east, and if he isn't then print up a response before returning to line 10.

Line 2388 ensures that we're in the correct location and also that the problem hasn't been solved already. If the player isn't in the desired place, or the problem has been dealt with, then we print a message and shuffle back to line 10.

Line 2389, the player's crowning glory, means that we set this particular problem solved variable (P47), increment the player's score, print up the relevant message, open up the new route now available to the player, set the solution variable (P48), as this problem can be approached in two different ways, only one of which works, and we then return to line 10 to wait for fresh input.

And that is all that the player can do when talking to characters. This only leaves us with lines 2390 to 2398, used for coping with attempts to communicate with people other than Strondbolger. Line 2390 settles what is contained in "third", and then another small sub-branch of the player routine we first of all eliminate the unknown (lines 2392 and 2394) before telling the player off for talking to inanimate objects to talk to any character in the adventure other than Strondbolger the Dry. This is, as line 2396 tells you, a straightforward "You are ignored" message.

#### Don't Worry

LINE 10: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 20: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 30: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 40: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 50: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 60: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 70: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 80: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 90: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 100: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 110: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 120: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 130: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 140: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 150: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 160: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 170: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 180: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 190: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 200: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 210: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 220: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 230: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 240: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 250: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 260: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 270: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 280: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 290: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 300: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 310: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 320: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 330: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 340: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 350: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 360: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 370: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 380: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 390: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 400: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 410: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 420: IF P44(37.5) = 37 THEN GOTO 1000  
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LINE 670: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 680: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 690: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 700: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 710: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 720: IF P44(37.5) = 37 THEN GOTO 1000  
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LINE 810: IF P44(37.5) = 37 THEN GOTO 1000  
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LINE 980: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 990: IF P44(37.5) = 37 THEN GOTO 1000  
LINE 1000: IF P44(37.5) = 37 THEN GOTO 1000

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## Adventure Contact

To help puzzled adventurers further, we are instituting an Adventure Helpline — simply fill in the coupon below, stating the name of the adventure, your problem and your name and address, and send it to Dragon User Adventure Helpline, 1210 Little Mapcot Street, London W22H 1PP. As soon as enough entries have arrived, we will start printing them in the magazine.

Don't worry — you'll find new Adventure Teams waiting to assist

Adventure .....

Problem .....

Name .....

Address .....



AMBIGUOUS malicious lies and rumours put about by scandal-mongers and thieves, our beloved editor forgot to remind yours truly about when the deadline for this month's issue expired. It expires about five minutes after I've finished this article, so to all those people who've sent in tapes this last month (hello Simon and A.H. Beasley and Robert Margrave and someone whose name is indecipherable but could well be Dini! Going for all I can make out) many apologies, and over the next week or so I'll be extracting the Dragon from its lair! Then I can dress it all up, dust it all down, and start all over again. All together now...

Actually I'm quite looking forward to Robert's game, as he gives a brief description of it in his accompanying letter. Apparently the game is called *The Jewel of Time*, and in it you have to stop time stopping. This, he says, "sounds quite easy but I've included some complications". Sounds easy? Ye gods, if Eirene had trouble with the staff (sorry Johnny, brief then I'm sure that even *Timekeeper* Pete's going to have the odd problem or two.

Mr. Beasley (he doesn't tell me his first name, must be shy) has a game called *The Temple of Ra*, and to quote "it has taken me a long time to complete it because it started off merely as something to fill in my spare time...". How often have we heard that, fellow adventure writers? I've just completed an adventure of my own based on that legendary dwarf Dini! Going and I thought I'd set some kind of a record by doing it in a week, writing it initially as a combination of favour for friend and interest in producing a truly bizarre adventure. Four weeks later, I was still putting in seven-hour sessions prior to writing this. That's the way it goes.

As for Simon Margrave, the man writes more adventures than Saint Adams, I'll be particularly interested in *The Meeting of Lili*, where Simon assures me that the answer is NOT 42, and that you have to control four characters. It would seem that you can make them eat, sleep, wait, drink, and, as he so delicately puts it, "do things to each other". The mind boggles, boggle boggle boggle it goes, and one hesitates to play this game with little ones in the room. We shall see, we shall see.

Why, you may wonder, am I mentioning all these games? Well, ever patient reader, you have noticed that there are previous

few adventures being released by commercial companies for your friend the Dragon these days. Indeed, as Simon points out, he hasn't heard of anything since *Belegarwood*, and that is quite some time ago. Consequently any individuals who are releasing games need all the publicity that they can get, and over the next couple of months I'll be doing the best that I can.

Why it should be that companies have deserted the Dragon in such droves is a bit of a mystery to me, since people haven't suddenly all got rid of their computers (apart from a temporary loss for Simon, whose machine blew up) and there is still a large number of Dragons in regular use by adventure fans. We'll show 'em!

But enough of this fearless crusade to restore the Dragon as an adventure player's friend, and on to your queries, whinges, whines and moans (a hint of sarcasm, perhaps?). First off this pile this month is a letter from Stephen. "It's really stuck!" Blood, which begins "Dear Pete 'The Great'", that's the way to do it, grovel your way to the top of the heap. Anyway, back to our old friend Synops. I must have had more letters about this game than any other, but this time a serious complaint. Stephen cannot find the string, and says that it is not in the place that the *Dragon User* possibly implies, or at least not in his version. Well, friend Stephen, we who have the complete solution can reliably inform you that if you follow the following ten steps you'll be well on your way to success, and this should also help a number of other readers who seem to get stuck at step 10. No backwards writing, because it takes too long, and the editor is, not literally one hopes, breathing down my neck.

- 1) Go to the 3rd computer (not a main one) and PRESS FIGHT.
- 2) Get the Fluffy Creature.
- 3) Go to the blank space with the alien creature.
- 4) Go forward 2 places and THROW FUZZ!
- 5) Get the light sabre.
- 6) Go to Vader and defeat him (easy-peasy, I know).
- 7) Look at the screen of the main computer.
- 8) Get the blanket and the SPINNING!
- 9) Go outside the airless corridor.

10) HOLD BREATH and enter corridor.

There, that should sort out a few problems for a collection of you Spooky-ists. Stephen's next query takes us on to another old favourite, *The Wicker Factor* (or unpoplar, depending on your point of view) adventure for the Dragon. Poor Stephen can't rig up the time machine to work, and so for the benefit of him and anyone else who's stuck at the same point, another collection of steps to take in order to get going, assuming that you've got the yellow and red cartridge and you've got into the cylinder by using the lift. Then...

- 1) Drop the cartridge and the sandwich. Cut the line and drop the hookcase. Squeeze the line, pour the juice then drop the lime peels and the vial.
- 2) Get the bird and the space suit. Wear the suit and get the coal. Put the coal and the bird into the device. While in the device insert the YELLOW cartridge and press the button.
- 3) Exit the time machine and examine the bookcase and the counter. Take the pink cartridge and the fuzzer. Open the desk and examine it. Read the document to find the combination of the safe. It is 11,29,42 (November 29th 1942).
- 4) Return to the time machine and drop the bag and the document and the pink cartridge. Go to the device. Drop the coal (get it from the time machine) and EXIT. Press the button and return to the time machine.
- 5) Remove the yellow cartridge and insert the red one.
- 6) Press the button then EXIT. Open the safe to get a blue cartridge.

Right, that's the story as far, and therein also the time machine up and running and you shouting about all over the place. Stephen should now no longer be "really stuck", but let us not forget the Pete 'The Great' bit, all right?

Where's the next letter? "Dear Dragon User" it reads. Oh well, down to earth with a bump again, as usual. An interesting letter this, from someone who will obviously be a doctor one day because their signature is not that good, but I assume it to be P.R. Elahi. Hey, what? Who knows? I'll annoy lots of people and say

that, because the writing isn't neat, P.R. (Eliot must be a male) has been delivering around in Minstrel and the Minotaur, and has extracted from it all the messages that are used by the game. I can't print the whole lot, there just isn't room, although using their techniques (by playing the rule according to a song on the parchment a secret passage has been exposed). Obvious, really, something you do every day isn't it, walking about playing flutes and finding secret passages. Anyway, P.R. (Eliot) also includes a list of the commands that the program will accept (and points out that the weird ones are spells), so for anyone still trying to plough their way through the game, here they are:

H GET IVY DROP BACK JUMP LAMP  
DRINK EAT FILL ASK/LOOK SCORCH ROLL  
RUSH OPEN HELP CLIMB TIE STAR  
WTRN MYTHA DREAM ASHUR  
MIRAL BELUCO CROM DHTAR PLAY  
THROW TAKE GRAB/QUIT UNCLE

Uncle? Intriguing command. Anyway, thanks for all that lot.

I know this name would crop up again 'ere long. Paul (Levi) Levi, who will be Paul from now on, asks me to tell all that his address is 40 Bellow Adventure, Row 30 Haters, Mersynside WA8 8SQ. And why? Because he has solutions to the following adventures available at 20 pence each, or you can get a little book containing the whole lot for £1.50. *Realms: Spygy: Shemsgans, Latin Space, Aquasun-47, Winter Factor, Black Scimitar, Premid's*

*Semis, Colista Island, Jerusalem Adventure 2, William Adventure 3.* I shall now quote from his letter: "They [you, in other words P.R.] must enclose an S.A.E. the size or a little bit bigger than *Dragon* (don't Answer Page to the *Dragon* user otherwise they are all big heads who win it)." This is a, controversy near its head once again, all letters of complaint to Paul, not me.

When not stopping people off, Paul has a few hints on Shemsgans for you. Once again, I quote: "... If you can't get the pole into the cave, go into the cave and look for a trap door in the roof. Open the door and go through it. When in the cabin go to the cave and get the pole. Go back to the cabin and then go through the trap door holding the pole". So there you go. And there's more, there's more. In *Spygy* (again) he says that "to survive the jump off the cliff just carry the blanket and the string". Finally, in *Aquasun 47* he says "To get through the force field tell Huey to Go North. When it the cave go E, S, E, E, N, W. Then get the mummy and go up". Mummy? I love it. Mummy, to you and me, incidentally at the bottom of Paul's letter is the figure 9. It is this age, it is astonishing, or perhaps it's just a comment about the Q\*oof "the big heads who win it". Perhaps we shall find out for next time.

El Diablo is another popular one that was, in its late life, sold without cassette inlay notes, thus causing problems for one or two of you who didn't have the faintest idea of what you were supposed to be doing. Since I haven't got space to print

them all now, we'll devote this month to printing Part One, and provided that I remember (oh chance!) I'll try, honestly, we'll start next month with Part Two. The original cassette inlay notes:

"You awake, dazed and confused, in the middle of a desert in the south-west. You had been learning the techniques of sorcery from an old man who lives in these parts. He told you that an evil sorcerer, a 'diablero', had become his enemy. Now your teacher is missing and you are alone. Where still, you can't seem to remember these techniques that you already had learned. The only thing that you can recall is this curious verse:

Remember well the power word,  
Remember that which twice you'd heard,  
Awake to that which dwells within.  
Throw off the yoke of ignorance.

"You have entered the world of El Diablero, where you must learn to acquire and use magical 'power' in order to prepare for the final confrontation with your adversary. All Diablero-accepts commands in the form of one or two word sentences. For example, LOOK AROUND or GET BOOK are valid commands. Only the first four letters of each word are used. Note: this is by no means an 'easy' adventure. If you are not an experienced adventurer you may want to try a simpler one first ..."

Me again, that'll have to do for now, part two later, so, from the *Dragon* Press, goodbye!

## CLASSIFIED ADS

**DRAGON 32** for sale. Keys sometimes do not respond properly. Alacgames, books and 1 Outkicker joystick with auto-fire switch. All for Dragon. Open to offers. Grand Denover, 17 Chippendale Drive, St. Austell, Cornwall PL26 8DE. Tel: (0726) 76230.

**DRAGON** hardware and software for sale—cheap! Barry Corath, 132 Donaghadee Road, Bangor, Co. Down BT22 4HN. Tel: (0287) 465050.

**DRAGON 64** with lots of games, utilities, books, joystick and recorder 076. Disk controller for Dragon: 036, 058-8 operating system with Basic-66 and Pascal, original copies 040 or 045 for the lot. M J Butler, 11 Underhill Drive, Basing, Portsmouth, Hants, Gosport, Tel: (0443) 268308.

**DRAGON PROGRAMS**, books and peripherals for sale from just 50 (wrapping may be considered, send your ad). For our full list and details, send an S.A.E. to C. Williams, 110 Alpine Rise, Strayville Grange, Coventry-C20 start

**DRAGON 64**. With joystick, books, games and various software £125. Also Dragon 5 joystick, etc., and back issues of D.U. £75. M. G. Johnson, 26 Radnor Road, Bracknell, Berks. RG12 0GD. Tel: Bracknell (0344) 43969.

**DRAGON 32** £80. Disk drive 036, Epson P-40 036 Joystick 05. Complete working system. Many books. All Dragon User D230 programs (03996). R. L. Ruston, 17 Arise Crescent, Bait, Aylesford RA15 2DU. Tel: Bait 2868.

**DRAGON 32**. Graphics table, cassette recorder, various books, light pen, Super Magic Alchemic cartridge Dreamart 08, Dragon User, 60 used tapes in racks, all levels etc., printer cables, joystick: £250 on, offers considered. Kevin Hall, 37 Isaac Lane, North Hykeham, Lincoln LN4 0AE. Tel: (0533) 45007.

**DRAGON 32**. Range 03891 tape recorder, Sanyo DM212 green monitor, joystick, many recorders, all leading. Tel: several books, stock (video) programs 065 and 066. Steven McLean, 54 Raydon Crescent, Bolton. Tel: (0562) 832710 even.

### HERE'S MY CLASSIFIED AD

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Please cut out and send this form to: Classified Department, Dragon User, 61-63 Little Newport St, London WC2H 9PP.

# All hands to the wall

Gordon Lee gets to grips with a series of amazing coincidences

MAZES are probably one of the oldest forms of puzzle. From ancient Greece comes the legend of the labyrinth of King Minos at Crete. This maze-like array of passages housed the Minotaur, a bull-like monster, until it was slain by Theseus, who was then able to escape by following a length of thread which he fastened to his belt.

In the early Christian era maze-like designs were used to decorate the early churches — either in miniature on ecclesiastical vestments, or in the form of a pavement on which a route to the centre could be traced. These mazes were not usually of a puzzle nature, as the route to be taken was generally 'forced' — that is, there was no branching, so the route was simply a convoluted path leading to the centre. Often these were used as a penance to be traversed on hands and knees. A guide book of 1969 described one such maze at the abbey of St. Stephen at Caen in Normandy:

"...the middle whorl represents a maze or labyrinth about two feet in diameter, and so artificially contrived that, were we to sup-



**A** join a man following all the intricate meanders of its volutes, he could not travel less than a mile before he got from one end to the other."

Mazes in Britain have appeared only within the last 500 years. The earliest of these were known as 'lure mazes' — that is, the paths were simply cut into the turf. This would allow the solver to be able to trace



**B** the route fairly easily, as he could see the overall plan of the maze. The hedge maze became fashionable in the late Renaissance, such as the one at Hampton Court, designed in 1690 for William III. There are not now so many still existing — possibly due to the enormous amount of upkeep which they require — although modern versions, usually with wood or concrete walls, are occasionally encountered. These can have an additional feature of gates at certain positions, which can be locked in either the open or closed position, and so allow the plan of the maze to be altered from time to time. The advent of the computer has now added a new dimension to the maze, and there are a number of games of this type available.

Finding the centre of a maze is fairly easy if a plan is available, but otherwise a different strategy must be used. A simple way to avoid being lost in a maze is to keep one hand in contact with the wall as you move about. This must be done from the moment of entering the maze, but it will ensure that you will eventually reach an exit. However, it doesn't guarantee that you will pass through the centre of the maze. This is dependent on the type of layout — either 'simply' connected, or 'multiply' connected. Maze A is of the simply connected type — that is, all of the dividing walls are directly connected to each other. The 'hand on wall' technique if used on this type of maze will take you to the outermost passageway in each direction, eventually bringing you back to the entrance. For this reason, most mazes are multiply connected, as in maze B. Here, the technique as outlined will bring you back to the entrance, but it is not likely unless the maze is very badly planned) to take you to the centre.

Next month, we will be looking at the way to solve multiply connected mazes, and in keeping with the tradition of featuring a puzzle game in the Christmas issue, there will be a maze program trying to allow you to put your pips to practice!

The competition this month is based on the word 'DRASCAF' again. In the inverted

tabular, it had better mean something really yiddish.

## August winners

Someone winning a prize in the August competition seems just a little bit more — well — expect that winning is a lot other month.

The twenty August winners follow, led proudly at the front by some other than Richard Long, who sent not only a program and an answer, but an entire work of art explaining why he wanted a prize. We can't reproduce it, too fantastic a scene is a bit strange, but here he is anyway:

Richard Long of Cambridge, Phil Sapiro of Houston, Christopher James of Atlanta, Alan Thomas of Staphurst, Martin Smith of Lewes, J. Smith of Teyford, Chris Lloyd of Orpington (he says it's for his mother-in-law), Dennis Gates of Durham, J. Painter of Streatham, P.J. Taylor of Aylesham, S.A. Newman of Addlestone, S.A. Soudou of Claxton, A.R. Henderson of Kirkcaldy, T. Pinner of Horden, Dave Lister of Pottershill, M. White of Sheffield, P.D. Madsen of Maidenhead, C. Nicholson of Cleveland, S.R. Barber of Sutton Coldfield and S. Watson of Winterton.

Some of the plans for the tabular were of a very private nature, but one of the less private ones was that of Phil Sapiro, who is going to take his for the next transatlantic party, so that he can go with his dragon.

## Solution

See opposite.

## Prize

UP at Preston I sat late. Roachdale — I mean, up at Roachdale, I said Mr. Preston (they all sound the same to me, those foreigners), and I said to him, what have you got best of this month? And he said, whatever you like. We negotiated Billie Carters and rollers, but settled in the end on 99 copies of Space Shuttle Fever, the new one from R & A. Preston, for those of you who can add six up to make 263.

## Rules

All in all, it's just another back in the Dragon. Grab your copy of the C&ED in 26 volumes, rev up your Dragon and find the words. Then pack up your answer, a copy of your program (if you wish), no cussies please. We don't mind two cussies, but the postman's having trouble with his discs. Any program rules you wish to add, stuff them in an envelope marked NOVEMBER COMPETITION, and send it off to us along with your name and address.

I've invented more solver words than you've had hot dinners, until my mother-in-law checked the dictionary at me (that's how I know it's got 50 volumes), so don't try anything with archaic, Arminian, bustard, or I'll redefine your definitions for you. What we want for this here tabular are some of the six letter words that nobody except you and your Dragon have ever seen before — and we want to know what they mean, too. They don't all add up to 263 this time. So if your word looks like

pyramid opposite, each letter has been entered in the top row of bricks. The row beneath contains the alphabetical position of each of the letters in the row above (A=1, B=4, etc.). The brick in each subsequent row is the sum of the two bricks immediately below it, reaching the final total of 263 in the bottom position.

How many other words can you find of six letters in each that also total 263? Preference should be given to common, rather than obscure, words, as the following list, although totaling 263, would not be allowed:

BLAZK — the hijacking of a bicycle  
 CLYEST — to walk in an unusual manner  
 COMPLE — a combination of enough and a snuff  
 DRIVEN — a playwright who can't spell

Can you do any better? (And, that's about enough for the debatable position for this month. See in the box below — Zet.)

|     |     |    |    |    |    |
|-----|-----|----|----|----|----|
| D   | R   | A  | G  | O  | N  |
| 4   | 18  | 1  | 7  | 15 | 14 |
| 22  | 19  | 8  | 22 | 29 |    |
| 41  | 27  | 30 | 51 |    |    |
| 68  | 57  | 81 |    |    |    |
| 125 | 136 |    |    |    |    |
| 263 |     |    |    |    |    |

This is Gordon Lee's own solution to the August competition — see page 86 for results

## The Answer

**ANSWER:** The full value of the factor is 18556455534785608547841

**SOLUTION:** This competition provides a good example of utilizing a routine to perform calculations with numbers larger than those which are normally within the arithmetic capability of the computer. The operation is done by doing the actual number being operated on as a string variable, and not as a numeric variable. This will allow numbers with over two hundred digits to be stored (even more if some method of splitting the number into sections is devised).

In the program, the actual mathematical operations are carried out by the subroutine at line 1808. This routine multi-

plies a multi-digit number held as a string variable, by a single digit value held as a numeric variable. Before going to the subroutine, the single digit is defined as variable M, and the multi-digit number is entered into string N\$. The resulting calculation is to be found in string variable P\$ on returning from the routine.

After the initial value of N\$ is set, the 75th power of this value is calculated. This is done by multiplying by 2, seventy-five times in the FOR/NEXT loop at line 55; the multiplier M already having been set to two at line 40. Note that at each stage in the loop the value P\$, which is returned by the subroutine, is transferred to N\$ before the next step in the operation.

The next step is to multiply the resulting total by 3 — once again using the same subroutine. The multiplier M is set to 3 in line 75, and the subroutine then performs the multiplication.

Finally it is necessary to add 1 to the product, and this is done at line 108 to 109. This is done by taking the whole digit from the string, adding 1 to it, and then replacing the value in its correct place in the string. Normally it would be necessary to check if the final digit was a nine as this would involve a "carry", which would affect the next figure to the left. However, as the previous operation was a multiplication by 3, the units digit would be either a zero or a five, and so this problem would not occur.

```

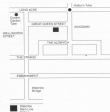
10 REM Set up initial value of M
20 M="1"
30 REM Compute the 75th power of 2
40 M=2:REM Set multiplier
50 FOR P=1 TO 75:DOWHILE LEN(M)=P:NEXT
60 REM Multiply by 5
70 M=5:REM Reset multiplier
80 DOWHILE 1000
90 REM Add 1
100 V=VAL(RIGHT$(M,1))
110 V=V+1:V=STR$(V):M=RIGHT$(V,2)
120 L=LEN(M)
130 P=L-LEFT$(M,L-1)+V
140 PRINT "The value of 2^75 * 5 + 1 is:";P:PRINT
150 END
160 REM Multiplication using strings
170 P="" :CARRY=0
180 FOR D=LEN(M) TO 1 STEP -1
190 T=VAL(RIGHT$(M,D,1))
200 V=T+CARRY
210 IF T>V THEN CARRY=(T\10):V=V-CARRY*10 ELSE CARRY=0
220 W=STR$(V):V=RIGHT$(V,2)
230 M=M+V+P
240 NEXT D
250 IF CARRY>0 THEN V=STR$(CARRY):V=RIGHT$(V,2):P=V+P
260 RETURN

```

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**Adults £2.00  
(£2.50 at door)**

**Children under 16 £1.00  
(£1.50 at door)**

To: JOHN PENN DISCOUNT SOFTWARE, DEAN FARM COTTAGE, KINGSLEY,  
BORDON, HAMPSHIRE GU35 9HG Tel: Bordon (04293) 5970

Please send me \_\_\_\_\_ adult tickets (at £2.00 each)

and \_\_\_\_\_ children tickets (at £1.00 each)

I enclose cheque/ postal order for \_\_\_\_\_

or I authorise you to debit my Access account no: \_\_\_\_\_

Signed \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_